MERCK

Sustainability Report

2020

content

Letter from the CEO

Dear Readers,

Science and technology are the keys to human progress. This is being demonstrated to us by the pandemic, which the world has been confronted with since last year. Globally, researchers are collaborating closely and vaccines have been developed in record time. This shows that technological progress and the positive force of science create sustainable added value for society.

At Merck, we are also contributing to the scientific community's efforts to fight the virus. For example, we are supporting over 50 vaccine projects, 35 Covid-19 testing solutions and the development of more than 20 therapeutic options worldwide.

As a science and technology company, we take on responsibility for finding answers to the most pressing challenges of our time. It is clear to us that sustainable entrepreneurship and profitable growth are not mutually exclusive, but rather mutually dependent. That is why we embedded sustainability as a firm element of our company strategy last year. At the same time, we set ourselves ambitious goals: In 2030, we will achieve human progress for more than one billion people through sustainable science and technology. By 2030, we will integrate sustainability into all our value chains. And by 2040, we will achieve climate neutrality and reduce our resource consumption.

We are committed to the United Nations Sustainability Development Goals. In this context, we are focusing on those fields in which our business operations can make the most impactful contribution. These include "Good Health and Well-being" and "Responsible Consumption and Production." In addition, since 2005, we have been supporting the United Nations Global Compact and its principles in the areas of human rights, labor standards, environmental protection, and anti-corruption. We underscored this position by signing the "*Statement from Business Leaders for Renewed Global Cooperation*" in 2020.

Our sustainability goals are ambitious. Yet we are already seeing promising results today. More than 1,100 of our Life Science products represent greener alternatives to conventional applications. For some of our solvents, we are already using non-food, renewable resources. For instance, we produce our solvent Cyrene™ from waste cellulose. We are also focusing on sustainable offerings in biotechnology. According to current projections, merely by optimizing the shipping properties of our ZooMAb® antibodies, we will be able to prevent the emission of around 75 metric tons of CO_2 per year by 2025. Specially insulated, ice-cooled

containers are no longer required to transport these antibodies, which are indispensable tools for a plethora of applications in medicine and research; they can instead be shipped and stored at ambient temperature.

To us, taking on responsibility also means learning from the experiences of the Covid-19 crisis. For example, this applies to the ways in which we work together. As part of our "Future Ways of Working" program, we developed principles in 2020 to improve future cooperation, for instance by applying new technologies, such as artificial intelligence, or by expanding our flexible working models. We plan to introduce these at all our sites around the world by the end of 2021 so as to enable many employees to freely choose when and where they work.

Beyond the boundaries of our company, we are dedicated to achieving fairer conditions, for instance in healthcare. Globally, people still do not have equal access to comprehensive healthcare, particularly in low- and middle-income countries. Together with partner organizations around the world, we are coordinating numerous activities in order to improve the situation in the most disadvantaged countries. For example, since 2007 we have donated 1.3 billion tablets to the World Health Organization to fight the tropical disease schistosomiasis. Moreover, through our comprehensive strategy ranging from diagnostics to hygiene measures and awareness campaigns, we are working to ultimately eliminate this devastating disease.

Research and technological progress are the most effective means of overcoming the challenges facing humanity. In this report, you will find many examples of how we create long-term sustainable value through our business activities. In doing so, we seek to balance environmental, social and governance aspects – for us as a company, for our stakeholders and for society at large. We expect all our businesses to make a positive contribution. We see this task as our corporate responsibility. With conviction, each and every day.

Sincerely,

Stefan Oschmann
Chairman of the Executive Board and CEO

strategy & Management

Within this chapter:

company profile

Part of the non-financial report

We are Merck, a vibrant science and technology company. Science is at the heart of everything we do. It drives the discoveries we make and the technologies we create. We make a positive difference in the lives of millions of people every day.

In the Healthcare business sector, we accompany people in every phase of their life and help them to shape, improve, and prolong it. We enable personalized treatments for serious illnesses and help many couples to realize their wish to have children. The digital platform and the products and services in our Life Science business sector make precision research simpler and help to speed up scientific breakthroughs. They enable quicker access to healthcare and ensure that analyses are accurate and medications are trustworthy. The developments we make in our Performance Materials business sector sit inside the technologies that are changing the way we use information and shaping our future. They make mobility safer, houses and devices more intelligent, and technologies more sustainable.

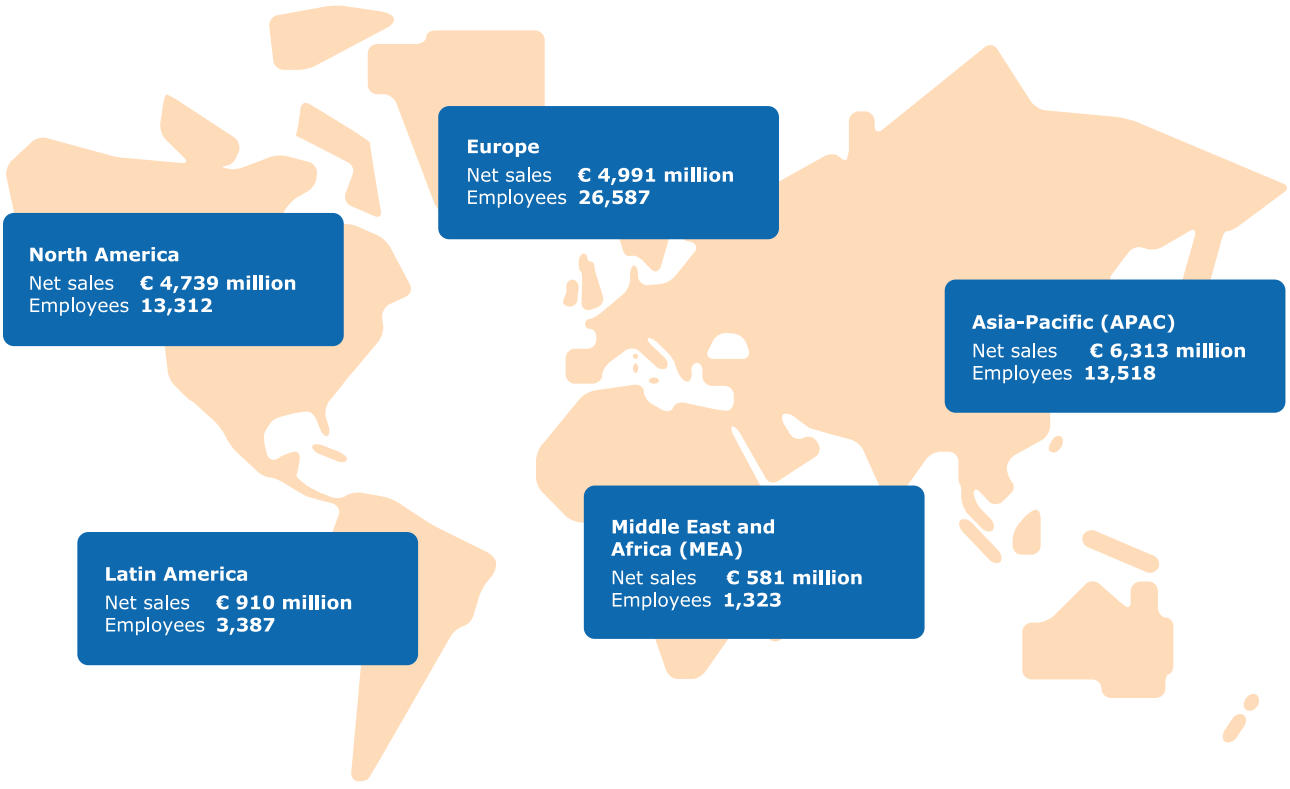
Everything we do is fueled by a belief in **science and technology as a force for good** - a belief that has driven our work since 1668, and will continue to inspire us to find more joyful and sustainable ways to live. We are curious minds dedicated to human progress.

We hold the global rights to the Merck name and brand. The only exceptions are Canada and the United States. In these countries, we operate as EMD Serono in the biopharmaceutical business, as MilliporeSigma in the life science business, and as EMD Performance Materials (now EMD Electronics) in the high-tech materials business.

Apart from our three business sectors, our financial reporting presents five regions: Europe, North America, Asia-Pacific, Latin America, and the Middle East & Africa. As of December 31, 2020, we had **58,127 employees worldwide**. This compares with 57,071 employees as of December 31, 2019.

In 2020, our 221 subsidiaries with employees in 66 countries generated sales of € 17.5 billion. Our 100 production sites are located across 21 countries.

Employees and net sales by region – 2020



Group structure

Merck comprises three business sectors: Healthcare, Life Science, and Performance Materials. As of March 2021, we changed the name of the Performance Materials business sector to Electronics.

Healthcare discovers, develops, manufactures, and markets innovative pharmaceutical and biological prescription drugs to treat cancer, multiple sclerosis (MS), infertility, growth disorders, and certain cardiovascular and metabolic diseases. Healthcare operates in four franchises: Neurology and Immunology, Oncology, Fertility, and General Medicine & Endocrinology. Our R&D pipeline positions us with a clear focus on becoming a global specialty innovator in oncology, immuno-oncology, neurology, and immunology. On March 31, 2020 Merck divested its allergy business Allergopharma to Dermapharm Beteiligungs GmbH, Grünwald, Germany.

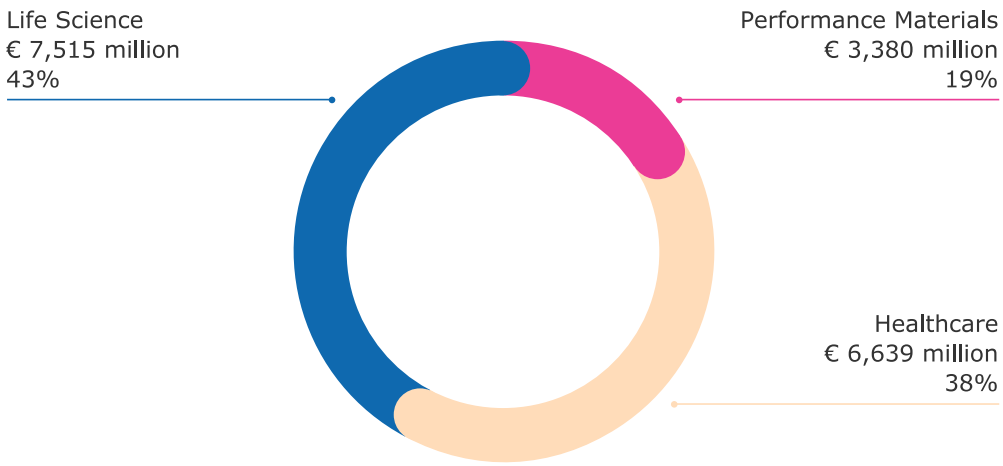
In **Life Science**, with our Research Solutions, Process Solutions, and Applied Solutions business units, we are a leading worldwide supplier of tools, high-grade chemicals, and equipment for academic labs, biotech, and biopharmaceutical manufacturers, as well as the industrial sector. Research Solutions provides our academic customers with the chemicals and biological tools needed to make scientific discovery easier and faster. Process Solutions provides drug manufacturers with process development expertise and technologies, such as continuous bioprocessing. Applied Solutions offers analytical workflows and both lab connectivity and digitization solutions to empower the labs of the future. Our complete portfolio comprises more than 300,000 products, ranging from lab water systems to genome-editing tools, antibodies, and cell lines, as well as end-to-end bioprocessing systems to support the manufacturing needs of both emerging biotech and large pharma companies. We have and will continue to play a critical role in aiding the ongoing response to the Covid-19 pandemic, supporting our customers working on combatting the novel virus through our products, services, and expertise.

Performance Materials is advancing digital living. Our main focus is on the electronics market with our materials and solutions changing the way we generate, access, store, process, and display information. In addition, our highly specialized, application-driven Surface Solutions business makes life more colorful. Together with our customers, we are discovering the next generation of high-tech materials and solutions. With strong growth trends such as 5G and Big Data, and new applications such as autonomous driving and Internet of Things (IoT), we have set the course for future growth.

The business sector consists of three business units: Semiconductor Solutions, Display Solutions and Surface Solutions. We offer innovative solutions especially for the electronics industry - for microchips and displays - and for surfaces of every kind.

With the completion of the Intermolecular and Versum Materials acquisitions, we achieved two major milestones to transform Performance Materials into a strong solutions provider and leading player in the electronic materials market. Effective March 4, 2021, we changed the name of the Performance Materials business sector to Electronics. The new name is the visible result of the strategic realignment conducted over the past several years.

Net sales by business sector – 2020



Governance

Based in Darmstadt, Germany, our company operates in the legal form of a corporation with general partners (Kommanditgesellschaft auf Aktien – KGaA). The general partner E. Merck KG holds around 70% of the total capital of Merck KGaA (equity interest); the shareholders hold the remainder, which is divided into shares (share capital). Our shares have been included in the DAX® 30, the blue-chip index of the Deutsche Börse, since 2007. In September 2008, our company was added to the FTSE4Good Index, a sustainability index that assesses the social, ecological and ethical conduct of companies.

Group strategy

Over the past years, Merck has grown significantly through a series of strategic moves that have enabled us to develop into a vibrant science and technology company. We have systematically and continuously strengthened and focused our portfolio of innovative science and technology throughout our business sectors.

With our Group strategy, we want to become the vibrant science and technology company. By 2022, we aim to have strong, innovative science- and technology-focused business sectors with leadership positions in our areas. We want to be a top-tier company in relation to our peers in terms of sales growth and margin, and we aim to continue to deliver sustainable returns to our owners.

We are now in the growth and expansion phase of our strategy and are well on track. Following the Versum Materials acquisition in 2019, we are giving priority to organic growth while rapidly lowering our debt and pursuing a sustainable culture of cost consciousness until 2022. We do not rule out making large transformative deals, yet in light of our strong business portfolio, it is more likely that we will complement our businesses through a number of small to medium-sized acquisitions after 2022.

To achieve our strategic ambition of becoming the vibrant science and technology company, we focus on our three Group-wide priorities: Performance, People, and Technology. Additionally, we are embedding the topic of sustainability into our Group strategy as an essential component. Through our business activities, we want to be economically successful and create value for society. At the same time, we endeavor to avoid generating subsequent costs for society.

You can find more information on our company strategy in our Annual Report 2020. Details on the sustainability strategy can be found there and here in the report.

sustainability strategy

Part of the non-financial report

The global community is facing numerous challenges that also affect our company and to which we are seeking answers. These challenges range from climate impact mitigation, resource scarcity, a growing global population and demographic change through to insufficient access to medicines for people in low- and middle-income countries. We are helping to find solutions to these issues and are continually working to sustainably shape technological progress for tomorrow. At the same time, we are working to become more resilient to potential risks.

Our approach: sustainable progress

Our ambition is to leverage science and technology to achieve lasting progress for mankind. For us, sustainable entrepreneurship and profitable growth go hand in hand. We can ensure our own future competitiveness only by creating value for society.

Responsible action is an integral part of our company culture. This also includes respecting the interests of our employees, customers and investors, as well as the community. For more than 350 years and across many generations, our company has been shaped and **guided by strong values**. Values that promote sustainability have always had a high priority – across all businesses.

Our innovative, top-quality products help us to resolve global challenges while securing our financial performance at the same time.

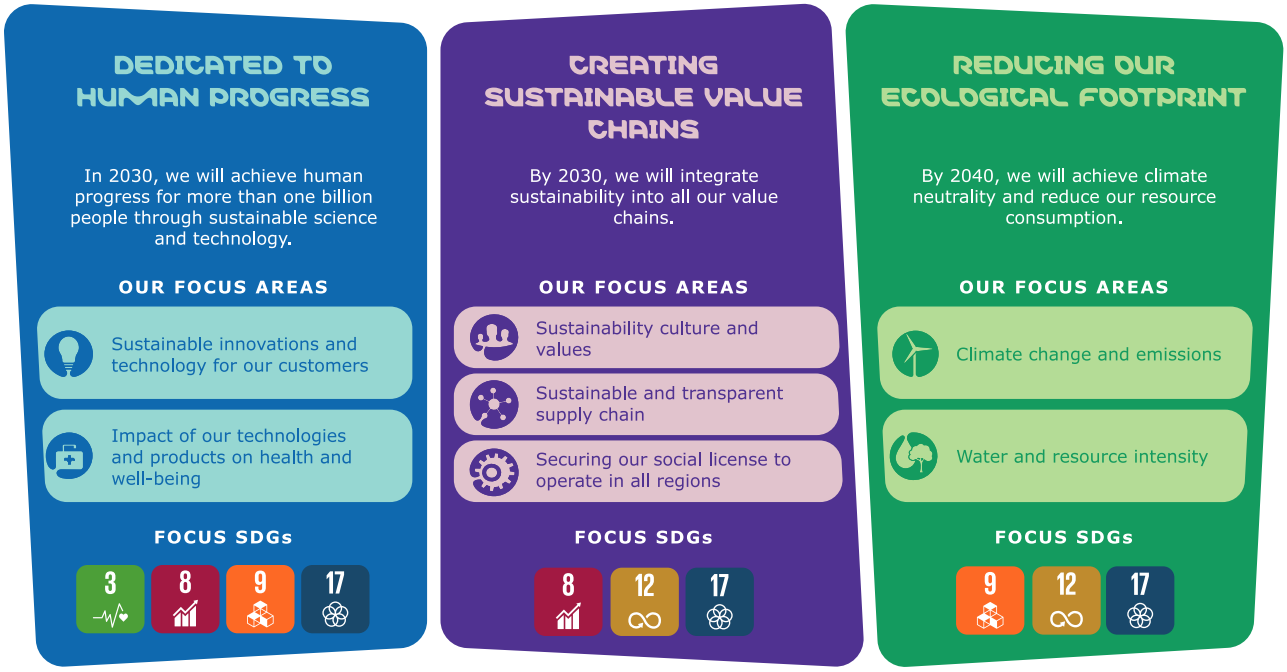
Safety and ethics matter just as much to us as business success. We **mitigate ethical, economic and social risks** as far as possible. We strive to keep our impact on the environment as low as possible, which is why safe production techniques, high environmental standards and strict quality management are a matter of course to us. Furthermore, we aim to strengthen our company by recruiting, developing and motivating talented employees. We want to set an example for ethical conduct.

We closely monitor new **global trends and challenges**. In order to clearly understand the complex nature of the expected changes, we make use of the so-called scenario technique, for example, which enables us to identify and incorporate aspects of strategic relevance. We also participate in dialogues and initiatives, share lessons learned and best practices with other organizations in our industry and assess media and news coverage. This allows us to minimize risks while also leveraging new business opportunities.

Defining a clear strategic direction

The rapidly growing challenges relating to society and the environment require a clear perspective for the coming years. That is why we are embedding the topic of sustainability into our Group strategy as an essential component. In 2020, we formulated new, strategic sustainability goals, which build on what we have achieved in recent years. Through our business activities, we want to be economically successful and **create value** for society. At the same time, we endeavor to avoid generating subsequent costs for society.

Our sustainability strategy



In order to firmly embed sustainability into our company, we have defined seven focus areas, within which we are currently implementing numerous initiatives and projects and will continue to do so in the future. We use various internal key figures to record and evaluate progress. Additionally, the company is planning to also link the long-term **variable compensation** of the Executive Board from 2022 onward with the progress made toward achieving the company's sustainability goals.

In order to assess the sustainability of our products, technologies and business activities, we have developed Sustainable Business Value (SBV), a tool that enables us to evaluate the positive and negative **impacts of our activities** on society along our entire value chain. In addition to ESG (Environmental, Social, Governance) parameters, SBV also incorporates economic and ethical aspects as well as digitalization and the benefit of the product itself. This gives rise to a monetary value that quantifies the societal benefits a product offers, for example, which helps us drive sustainability across our business operations and position ourselves for future success.

How we steer sustainability

Our Executive Board, which has overarching responsibility for our sustainability strategy, has approved our three strategic goals.

The Group Corporate Sustainability unit, which is responsible for crafting and shaping the sustainability strategy, regularly informs the Executive Board about the progress made and the need for action. This unit is also part of our Group Corporate Affairs function, which reports to the Chairman of the Executive Board. Group Corporate Sustainability is also responsible for the outcomes of the Corporate Sustainability Council. Having a broader scope of tasks, the Corporate Sustainability Council replaced the previous Corporate Responsibility Committee. As was the case with the previous committee, the new council consists of representatives from our business sectors and from key Group functions, such as Procurement, HR and Environment. However, in the future, its composition will reflect regional aspects to a greater extent and include council members from the regions. The Corporate Sustainability Committee, which steers and monitors the **implementation of the sustainability strategy**, recommends corresponding initiatives to the Executive Board. The council uses the results of our regularly conducted materiality analyses and the comparison with the individual business strategies to adjust the sustainability strategy throughout the Group. In addition, it ensures that the initiatives of our various business sectors, Group functions and subsidiaries align with our Group-wide Sustainability strategy. The measures adopted by the Corporate Sustainability Council are implemented by our line managers as well as by interdisciplinary project teams.

In 2020, the Corporate Responsibility Committee met twice via video conference. The central topics were, firstly, the development of the new sustainability strategy, secondly, the Sustainable Business Value method to measure the effectiveness of sustainability activities and thirdly, the development of new climate impact mitigation goals. The participants also discussed supply chain legislation, human rights and animal welfare. In 2021, the new Corporate Sustainability Council will meet and thus replace the Corporate Responsibility Committee on the operating side as well.

sustainable development goals

The United Nations (UN) 2030 Agenda is a global plan to promote sustainable peace and prosperity and to protect our planet. Since 2016, countries and organizations have been working to implement this agenda with its 17 Sustainable Development Goals (SDGs). Our goal is for our business activities to create shared value that is both measurable and makes a recognizable contribution. In this context, we rely on the power of science and technology – with responsibility for the well-being of mankind.

Our contribution at a glance

In 2020, we set ourselves new, strategic sustainability goals and embedded them into the overall strategy of our company. Among other things, we analyzed how we can actively contribute to the sustainable development of society and achieve the Sustainable Development Goals. The analysis showed that we have the strongest positive impact on five SDGs through our entrepreneurial actions. Further information can be found under Sustainability strategy.

We summarize our contribution as follows:

SDG 3 – Good health and well-being

With our products, we create a positive impact on the health and quality of life of people around the world. Through technological and scientific innovations, we are also helping to improve the health of underserved populations in low- and middle-income countries.

SDG 8 – Decent work and economic growth

We see it as our responsibility to respect human rights both within our company and along our supply chain. That is why we are dedicated to upholding appropriate and fair labor and social standards. We want to drive sustainable economic growth through progressive resource efficiency.

SDG 9 – Industry, innovation and infrastructure

We use our expertise in science and technology to make our products, processes and infrastructure sustainable. In addition, we want to promote the work of scientists worldwide with our innovations and support programs.

SDG 12 – Responsible consumption and production

We use resources efficiently and reduce waste and emissions. We pay attention to this in our product development and in our manufacturing activities. We also help our customers to manufacture their products more sustainably and efficiently and to achieve their own sustainability goals.

SDG 17 – Partnerships for the goals

We need strong partners in order to drive sustainable development within our company and beyond and to better meet societal challenges. We therefore collaborate with a wide array of organizations, companies, federations, and networks.

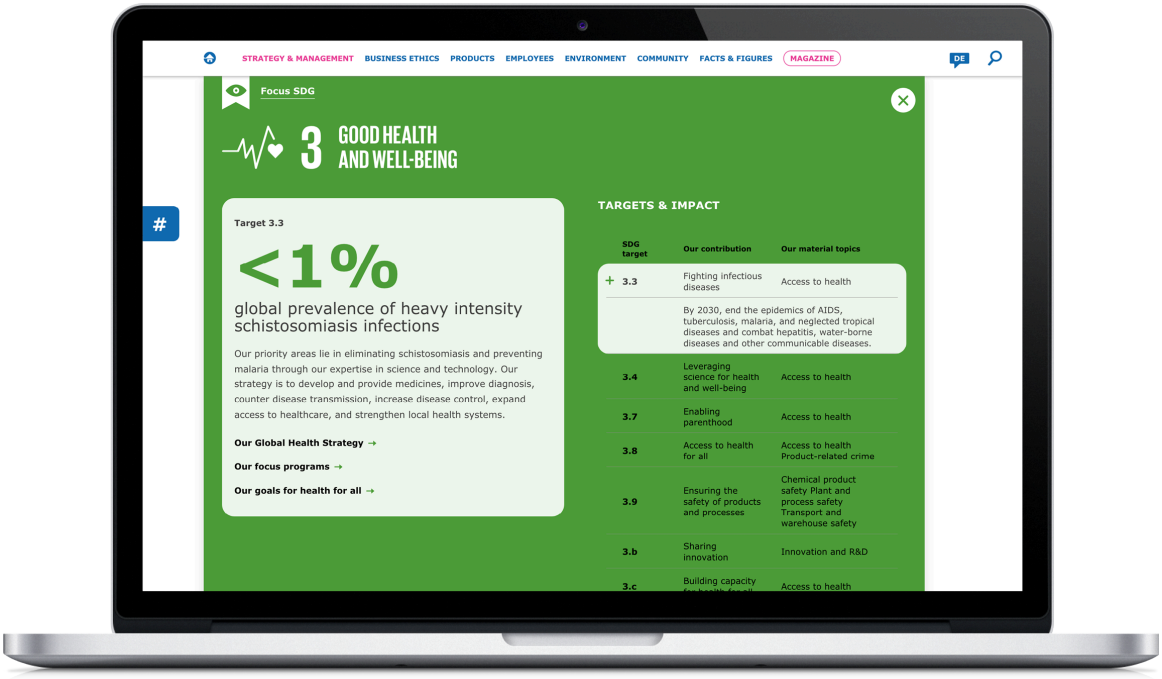
Through our sustainability strategy, we help **to solve challenges globally**, and not only within these five SDGs. Our management approaches and projects also support **SDG 4** (Quality education), **SDG 5** (Gender equality) – supplemented by diversity and inclusion, **SDG 6** (Clean water and sanitation), **SDG 7** (Affordable and clean energy), and **SDG 13** (Climate action).

More detailed information on our quantitative and qualitative contributions to the SDGs is summarized in an **interactive tool**.

Our contribution in detail

In our online report, we offer an interactive tool to visualize how we contribute to the SDGs in qualitative and quantitative terms.

Clicking on one of the highlighted SDGs provides further information for each of the targets on how we specifically support them through our management approaches, initiatives and projects.



stakeholder dialogue

Our business activities converge with the interests of many people, which is why engaging with our various stakeholders is particularly important to us. Through this dialogue, we communicate our decisions and actions transparently in order to secure our social license to operate. We aim to unite divergent interests as far as possible, as well as build and sustain trust.

Dialogue at various levels

Our key stakeholders include our employees, customers and business partners, patients, the Merck family as the majority owner of the company, shareholders, and our suppliers. We engage in a continuous dialogue with our stakeholders. We use this exchange to identify important trends and developments in society and in our business areas – and to take them into account when shaping our responsible entrepreneurship.

Our stakeholders

We regularly conduct a systematic materiality analysis, which gives us indications of **stakeholder expectations**. In this way, we identify the economic, social and environmental issues that are important to our stakeholders – and thus also to us.

We have established guidelines and principles for interaction with certain stakeholders. The focus is always on acting in accordance with the rules. For example, we have defined internal policies and review processes for patient relationships as well as interactions with healthcare stakeholders and business partnerships.

We communicate regularly with our stakeholders through a variety of channels. For instance, we conduct stakeholder surveys or organize topic-specific dialogues at regional, national and international level. We also participate in discussions and informational forums as well as through our advocacy work and industry coalitions. Here are some examples of the dialogue formats used:

Employees

Employee engagement surveys

- Understanding our employees
- Our approach to preventing accidents and promoting health

Intranet "EVA"

- Keeping employees informed and encouraging dialogue

Germany-wide ideation program

- Encouraging and rewarding ideas

Career fairs

- Our approach to attracting and retaining talent

Patients

Patient Advisory Boards (PAB) to engage patient organizations in our clinical research

- Close dialogue with patients and advocacy groups

Member of various initiatives on the quality and efficiency of clinical trials

- Close dialogue with patients and advocacy groups

Employee representatives

Involvement of local employee representatives in company decisions

- How we engage our employees
- Performance-based pay

Scientists

Merck Bioethics Advisory Panel; Digital Ethics Advisory Panel

- Digital Ethics Advisory Panel

Communities

Discussion and information forums for residents in the vicinity of our sites

- Roundtables and informational forums

Healthcare systems

Event series

- Alliances for better access to health
- Discussions at a global level

Collaboration with health authorities and other stakeholders

- Alliances for better access to health

NGOs

Network meetings

- Discussions at a global level

Collaborations

- Focus programs

Associations / Politics

Collaboration in working groups

- Alliance for Integrity
- Advocacy groups and industry coalitions

Suppliers

Supplier surveys

- Secure: How we are moving towards zero deforestation

Dialogue events

- Discussions at a global level
- Access delivery mentorship

Shareholders

Annual General Meeting

- Investor relations

Events for investors

- Capital market days

Public authorities

Subject-specific cooperation

- Group-wide anti-counterfeiting network
- Monitoring drug safety

Further information on stakeholder dialogues can be found in the individual report chapters.

Roundtables and informational forums

We hold roundtable discussions and informational forums for local residents at our major sites. Since 1994, we have been holding an annual public planning forum in Darmstadt to discuss the development of our site with members of the city council, local authorities and the community.

Involvement in initiatives

We collaborate with an array of civic organizations such as the Goethe-Institut and the World Environment Center (WEC). We also participate in other initiatives that share our commitment to responsible corporate conduct, such as Chemie^3 and Responsible Care®.

Advocacy groups and industry coalitions

We actively participate in the **political process** and advocate our positions and views by engaging policy makers in a direct dialogue as well as through our work with industry coalitions. Major national and international industry associations in which we are members and hold positions are:

- German Federation of Chemical Employers' Associations (BAVC)
- Confederation of German Employers' Associations (BDA)
- European Federation of Pharmaceutical Industries and Associations, (EFPIA)
- International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)
- Pharmaceutical Research and Manufacturers of America (PhRMA)
- German Chemical Industry Association (VCI)
- European Chemical Industry Council (Cefic)
- German Association of Research-based Pharmaceutical Manufacturers e.V. (vfa)

Political donations

We do not donate to political parties or related organizations, holders of public office or candidates for such office, nor do we offer them any other financial value. Contributions in the context of political dialogue and information exchange must always **comply with the applicable laws**. This approach is stipulated in our internal guidelines. In the United States, political action committees (PACs) have been set up through which our employees can donate money to support political candidates and organizations. These are not donations made by our company, but rather contributions made by employees. The contributions donated are reported to the U.S. Federal Election Commission and are fully disclosed.

Materiality analysis

Part of the non-financial report

To understand which social, economic and environmental issues matter most to our stakeholders and to our long-term business success, we conduct an annual materiality analysis. This also enables us to meet the applicable reporting requirements of the Global Reporting Initiative (GRI) and the German CSR Directive Implementation Act.

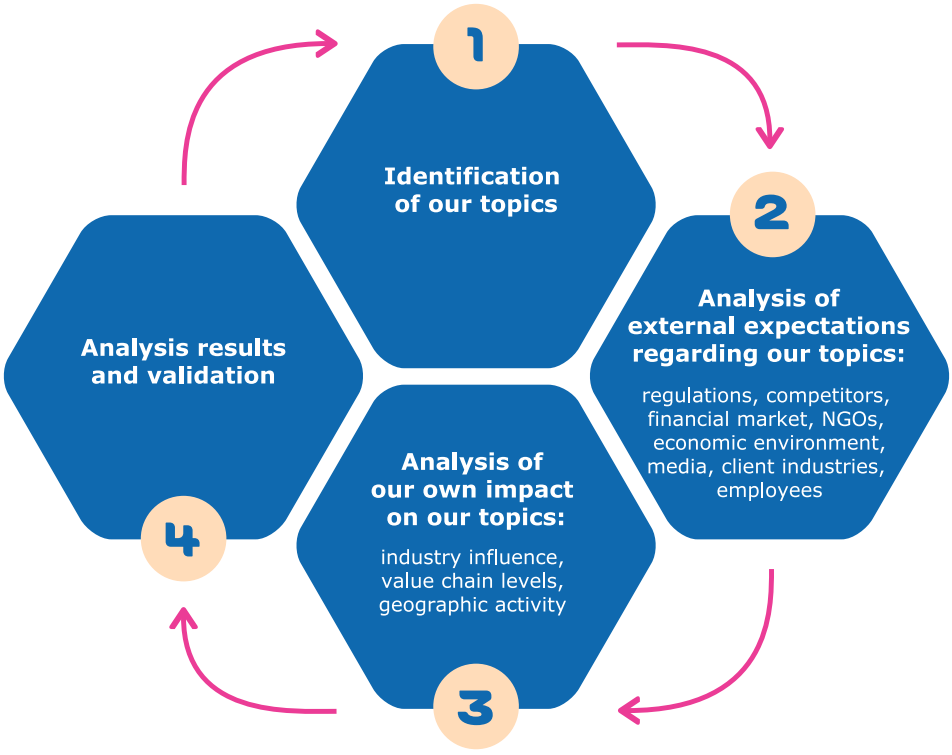
Material issues updated and validated

Conducting materiality assessments helps us define and verify key topics for our sustainability management and for the contents of our report. We conducted our last comprehensive analysis in 2018, which reflected the requirements and expectations that our stakeholders place on us. In 2019 and 2020, we built on this approach and extended the analysis to include even more stakeholders and impact factors. In 2020, the materiality analysis therefore included:

- Relevant regulations
- Goals and positions of our competitors
- Requirements imposed by investor ratings
- Expectations that non-governmental organizations (NGOs) express towards the chemical and pharmaceutical industries
- The relevance of sustainability topics to our economic environment
- Media resonance
- Issues that are relevant to our clients' industries (new in 2020)
- Issues that matter to our employees (new in 2020).

The analysis also includes the ways in which our industries, value chain and sites impact sustainable development.

Materiality process



Results of the update

The 35 topics identified as being significant to our sustainability management and reporting did not change relative to the 2019 analysis. The results changed minimally because **employees and client industries** were incorporated into the analysis, but this impacted neither the reporting framework nor the contents.

We disclose information on our tax governance for the first time in this report. This topic has not yet been defined as one of our material topics, but we expect it to gain more relevance for our reporting audience in the future.

Material topics

Resource efficiency
- Waste and recycling
- Water management

Product safety and quality
- Patient safety
- Chemical product safety
- Product-related crime
- Transport and warehouse safety

Supply chain standards
- Supply chain standards

Environmental protection
- Emissions
- Energy efficiency and renewable energies
- Greenhouse gas emissions
- Plant and process safety
- Biodiversity

Health for all
- Prices of medicines
- Access to health
- Health awareness

Ethical conduct
- Bioethics
- Clinical studies
- Animal welfare

Sustainable products
- Sustainable products (including design, packaging and recycling)

Human rights
- Human rights

Good business practice
- Compliance
- Data protection
- Governance
- Responsible marketing
- Interactions with health systems
- Community engagement

Technology
- Digitalization
- Innovation and R&D

Attractive employer
- Health and safety
- Attracting and retaining employees
- Good leadership
- Employee engagement
- Employee development
- Diversity
- Future of work

Most important · Very important · Important · Part of the non-financial report

Topics for the non-financial report

The German CSR Directive Implementation Act obliges us to review the **double materiality** of topics according to section 289c (3) of the German Commercial Code. The principle of double materiality requires companies to disclose non-financial information when the following two criteria are met: Firstly, the information is necessary to understand the company's business performance, business results and financial situation and secondly, the information makes it possible to understand how the company's business activities affect non-financial aspects.

In 2020, we again reviewed the double materiality of the identified topics. We extended the review methodology and evaluated the following factors:

- Significant impact on expenses and income
- Significant impact on cash flow
- Impact on reputation
- Regulatory requirements
- Impact on the business model/future business areas/ R&D.

This year, for the first time, the topics of "Supply chain standards", "Energy efficiency and renewable energies" and "Greenhouse gas emissions" reached the double materiality threshold and are therefore included in the non-financial report. Topics that were included in the non-financial report in 2019 are also included this year. Topics that fall within the scope of the double materiality definition are marked in the materiality matrix and linked to the respective chapters in this report.

Material issues in our value chain

The following table shows where our material issues fall within the value chain: upstream in our supply chain, in the course of activities within our own business sectors or downstream with our customers and patients. Moreover, we listed the issues to show the breakdown of materiality by stakeholder groups.

	Upstream activities	Healthcare	Life Science	Performance Materials	Downstream activities
Product safety and quality					
Chemical product safety		✓	✓	✓	✓
Material for:	Customers, Merck family, NGOs, regulatory agencies, sales and business partners, shareholders				
Patient safety		✓			✓
Material for:	Health systems, Merck family, NGOs, patients, regulatory agencies, shareholders				
Product-related crime		✓	✓	✓	✓
Material for:	Customers, federations and policy makers, health systems, Merck family, NGOs, patients, regulatory agencies, sales and business partners, shareholders, patients				
Transport and warehouse safety	✓	✓	✓	✓	✓
Material for:	Communities, customers, regulatory agencies, sales and business partners, suppliers				
Ethical conduct					
Bioethics		✓	✓		✓
Material for:	Customers, federations and policy makers, media, NGOs, regulatory agencies, scientists				
Clinical studies	✓	✓			✓
Material for:	Federations and policy makers, media, Merck family, NGOs, patients, regulatory agencies, scientists, shareholders, suppliers				
Animal welfare	✓	✓	✓	✓	
Material for:	Media, NGOs, regulatory agencies, scientists, suppliers				

Good business practice

Compliance	✓	✓	✓	✓	✓
Material for:	Competitors, employees, health systems, Merck family, NGOs, regulatory agencies, sales and business partners, shareholders, supplier				
Responsible marketing		✓	✓	✓	✓
Material for:	Customers, federations and policy makers, health systems, media, patients, sales and business partners				
Community engagement		✓	✓	✓	✓
Material for:	Communities, employees, media, Merck family, NGOs				
Interactions with health systems		✓			✓
Material for:	Federations and policy makers, health systems, NGOs, patients, regulatory agencies				
Governance	✓	✓	✓	✓	✓
Material for:	Customers, employees, employee representatives, Merck family, regulatory agencies, sales and business partners, shareholders, suppliers				
Data protection	✓	✓	✓	✓	✓
Material for:	Customers, employees, employee representatives, patients, sales and business partners, suppliers				

Health for all

Access to health		✓	✓		✓
Material for:	Health systems, media, NGOs, patients, sales and business partners				
Prices of medicines		✓			✓
Material for:	Health systems, media, Merck family, NGOs, patients, sales and business partners, shareholders				
Health awareness		✓			✓
Material for:	Communities, competitors, health systems, media, NGOs, patients, sales and business partners				

Supply chain standards

Supply chain standards	✓	✓	✓	✓	✓
Material for:	Competitors, customers, federations and policy makers, media, Merck family, NGOs, shareholders, suppliers				

Human rights

Human rights	✓	✓	✓	✓	✓
Material for:	Communities, customers, employees, federations and policy makers, media, NGOs, suppliers				

Sustainable products

Sustainable product design			✓	✓	✓
Material for:	Customers, scientists				

Attractive employer

Diversity		✓	✓	✓	
Material for:	Employees, employee representatives, media, Merck family				
Recruiting and retaining employees		✓	✓	✓	
Material for:	Competitors, employees, employee representatives, Merck family, shareholders				
Employee development		✓	✓	✓	
Material for:	Employees, employee representatives				
Good leadership		✓	✓	✓	
Material for:	Employees, employee representatives				
Employee engagement		✓	✓	✓	
Material for:	Employees, employee representatives				
Health and safety	✓	✓	✓	✓	
Material for:	Employees, employee representatives, regulatory agencies				
Future of work		✓	✓	✓	
Material for:	Employees, employee representatives				

Technology

Innovation and R&D	✓	✓	✓	✓	✓
Material for:	Customers, health systems, Merck family, patients, scientists, shareholders				
Digitalization	✓	✓	✓	✓	✓
Material for:	Customers, patients, scientists, sales and business partners				

Resource efficiency

Waste and recycling		✓	✓	✓	✓
Material for:	Communities, customers, NGOs, regulatory agencies				
Water management		✓	✓	✓	✓
Material for:	Communities, NGOs, regulatory agencies				

Environmental protection

Energy efficiency and renewable energy		✓	✓	✓	✓
Material for:	Customers, federations and policy makers, NGOs				
Greenhouse gas emissions	✓	✓	✓	✓	✓
Material for:	Customers, federations and policy makers, media, NGOs, regulatory agencies, suppliers				
Plant and process safety		✓	✓	✓	
Material for:	Employees, media, Merck family, regulatory agencies, shareholders				
Biodiversity		✓	✓	✓	
Material for:	Federations and policy makers, NGOs, regulatory agencies				
Emissions		✓	✓	✓	
Material for:	Federations and policy makers, NGOs, regulatory agencies				

Business ethics

Within this chapter:

corporate governance

Governance

Part of the non-financial report

For more than 350 years, responsibility has been an integral part of our corporate identity. It is one of our six company values, alongside courage, achievement, respect, integrity, and transparency. These core values guide us in our daily work, defining how we interact with our customers and business partners. We endeavor to give our best for patients and customers – and find solutions for the world of tomorrow.

Our approach to responsible governance

The requirements we place on responsible corporate governance are derived from our company values and the regulations, external initiatives and international guidelines to which we are committed. We have integrated these requirements into our Sustainability strategy and our Group-wide guidelines. These guidelines comprise **charters and principles** that are valid for the entire company as well as specific standards and procedures for individual business sectors and sites.

Some examples: Our Human Rights Charter aligns with the UN Guiding Principles for Business and Human Rights. Our Group-wide Social and Labor Standards Policy reflects the labor standards of the International Labour Organization (ILO). Our EHS Policy (Corporate Environment, Health and Safety Policy) for environmental impact mitigation and health and safety forms the basis for implementing the chemical industry's Responsible Care® Global Charter within our company. Our Regulatory Affairs Governance Policy for chemical products sets out the processes and management structures for product safety.

We comply with all applicable laws as a matter of principle. Where necessary, we review our internal guidelines, standards and instruction manuals on compliant behavior and adapt them to reflect changes in the regulatory landscape.

How we live responsible governance

Based on the requirements set forth in charters, principles and policies, our internal standards give specific guidance for operational processes. They are constantly updated by the relevant departments and are available on our intranet. Our managers implement these standards in their respective areas of responsibility and ensure that they are adhered to. In addition, we educate and train our employees on all guidelines that apply to them.

We employ **management systems** to steer processes and define goals, actions and responsibilities. These systems are based on standards, such as the internationally recognized quality management standard ISO 9001, good working practices (GxP) in the pharmaceutical industry and ISO 14001 for environmental management. Our company regularly undergoes ISO 14001 and ISO 9001 certification, which is conducted by an independent auditing firm. We hold group certificates for both standards.

We support the following responsible governance initiatives:

- We have been a participant in the United Nations Global Compact since 2005 and are committed to complying with its principles. Our annual progress report illustrates how we live our responsibility in our day-to-day actions.
- As a signatory to the chemical industry's Responsible Care® Global Charter, we voluntarily go above and beyond what is required by law and have adopted mandatory standards for product responsibility, environmental impact mitigation and health and safety.
- As a member of the **Together for Sustainability** (TfS) network, we are dedicated to improving supply chains with respect to environmental, compliance and social standards.
- We are also a member of **Initiative Chemie[3],** a collaboration between the German Chemical Industry Association (VCI), the Federal Employers' Association for the German Chemical Industry (BAVC) and the German Mining, Chemical and Energy Industrial Union (IG BCE). The partners of this globally unique alliance seek to make sustainability a core part of the chemical industry's guiding principles and to jointly drive the sector's position within the German economy as a key contributor to sustainable development.

Compliance Management

Part of the non-financial report

Responsible entrepreneurship starts with compliance. We take steps to ensure that all our activities adhere to relevant laws, regulations and ethical standards around the world. This also helps us to protect our reputation as an employer and business partner.

Our approach to compliance

Compliance is one of our primary considerations worldwide. As an international company with operations also in low- and middle-income countries, we have stringent requirements for effective compliance management. Importantly, we seek to emphasize compliance by acting in line with our company values and believe that profitable business operations should go hand-in-hand with the highest ethical standards.

How we ensure compliance

Our Group Compliance function is responsible for the policies on the following core topics: anti-corruption and anti-bribery (including healthcare compliance, third-party due diligence, transparency reporting), anti-money laundering,antitrust, and dawn raid preparedness.

To cover these compliance topics, we have **Group-wide policies** and procedures in place that ensure our business activities align with the relevant laws, regulations and international ethical standards. Other compliance-related issues, including the respective internal regulations and guidelines, such as Pharmacovigilance, Export and Import Controls, and Environment, Health, Safety, Security, Quality, are managed by the responsible functions.

Our Group Compliance function is responsible for our **compliance portfolio**, which consists of the following elements:

- **Risk Assessment:** Identifying internal and external critical risks in regular business operations
- **Policies & Procedures:** Global policies, procedures and standards to mitigate identified risks (see the "Our commitment: guidelines and standards" section for more details)
- **Compliance Committees/forums:** Platform for compliance-related discussion and decision-making that includes relevant key functions
- **Training & Awareness:** Appropriate training and additional measures to educate and keep awareness high
- **Programs & Tools:** Comprehensive compliance programs and supporting tools that contribute to internal controls and overall governance, such as third-party risk management
- **Monitoring & Reporting:** Tracking of compliance-related data as well as performance of internal and external reporting
- **Case Management:** Timely response to reports of misconduct and implementation of corrective actions
- **Continuous Improvement:** Based on and applying to all elements of our compliance program

We continuously review our compliance portfolio and update our initiatives and programs where necessary. This approach reflects new requirements as well as internal and external risks, such as those resulting from amendments to legislation, relevant industry codes or changes affecting our company. We drive regular and targeted **communication** and exchange internally within our compliance organization and externally with our stakeholders and business partners to discuss current compliance matters, trends and goals. We keep the focus on **our people** by ensuring the availability of appropriate resources and skills, maintaining clear roles and responsibilities and, based on employee feedback, setting aligned and harmonized goals. We also ensure that our organizational structure is always up to date and suitable for our business needs.

Our Group Compliance Officer reports on the status of our compliance activities, potential risks and serious compliance violations to the Executive Board and supervisory bodies every six months at a minimum. As part of our regular reporting processes, we compile a comprehensive **compliance and data privacy report** annually for the Executive Board, detailing the status of our compliance program, continuous improvement initiatives and key figures on compliance and data privacy cases. Additionally, we prepare a mid-year update to highlight ongoing developments and the status of relevant projects and initiatives.

Our Group Compliance Officer oversees approximately 95 Compliance Officers and Compliance experts around the world. The Compliance Officers implement our compliance program within their respective areas of responsibility (with local necessary adaptions if legally required) and receive guidance from our Group Compliance Center of Expertise, a centralized body that drives the design and updating of our compliance program across all business sectors and Group functions.

As part of the Group Compliance Center of Expertise, our global team for coordinating transparency reporting is responsible for incorporating current and upcoming transparency **reporting requirements in the healthcare sector** – including those of the European Federation of Pharmaceutical Industries and Associations (EFPIA) and the United States Physician Payments Sunshine Act.

More information on our Healthcare governance and compliance activities can be found in the Responsible interactions with health systems section.

Integrating acquisitions into our compliance system

The implementation of our compliance program at legacy Versum Materials has been completed. Legacy Versum Materials entities and sites will sometimes be referred to separately to address specific needs but are now included as part of the Performance Materials organization for future compliance program evolution at Merck. Two role-dependent e-learning training courses will be targeted to legacy Versum Materials employees in 2021. These programs, entitled Global Anti-Corruption Standards and Understanding Global Antitrust and Competition Laws, will supplement the Merck Code of Conduct training they have already received.

As of 2020, Versum Materials and Intermolecular are part of the annual audit planning process of Group Internal Auditing. In January 2020, a "post day 1 audit" and in October 2020, an "Integration 12 months post Day 1 audit" for Versum Materials was performed. Further audits, such as those carried out at Versum Materials Korea or Intermolecular, are part of the **2021 Internal Audit Plan**, as approved by our Executive Board.

Our commitment: guidelines and standards

Our compliance program builds on our company values and integrates these into our compliance framework, which contains Group-wide **policies and procedures** for entrepreneurial conduct, which are mandatory for all our employees:

The Merck Code of Conduct guides our people in conducting business ethically – in line with our values and the law. It is available to all employees worldwide in 22 languages.

Our Human Rights Charter supplements our Code of Conduct with globally recognized principles on human rights.

- Our **Anti-Corruption Policy** stipulates that all business activities must be conducted in line with legally applicable anti-corruption standards. All forms of bribery are strictly prohibited.
- Our global **Money Laundering Prevention Policy** defines and describes the internal global process and assurance measures to protect our company from being misused by third parties for money laundering activities.
- Our Group-wide **Antitrust and Competition Law Policy** states that all business activities across the Group must be conducted in compliance with applicable competition regulations at all times. We acknowledge the importance of fair competition and expect the same of partners acting on our behalf.
- Our **Compliance Reporting and Investigation Policy** includes the basic steps for an internal compliance investigation. Its purpose is to ensure an appropriate, timely and thorough response to compliance-related reports of potential misconduct relating to any kind of internal or external regulations or policies.
- Our new **Healthcare Ethical Guiding Principles** provide our healthcare employees with ethical guidance for decision making and activities while taking the particular challenges and responsibilities of this business sector into consideration. See the Responsible interactions with health systems section for more details.
- Our **Pharma Code** for prescription medicines as well as underlying policies and additional guideline documents set out key principles for interactions with stakeholders in the health industry.
- Our new **Standard on Local Compliance Standards** implements a review and approval process for local governance documents in areas under the responsibility of the Group Compliance function. This helps to ensure a uniform approach while retaining sufficient flexibility to address stricter or more specific requirements and needs on a local level. Our local teams can thus adhere to our compliance principles and guidance while implementing **specific local policies or procedures** that comply with local regulations.

Impact of the Covid-19 pandemic on our compliance mechanisms

Due to travel restrictions and in order to keep our employees safe, we had to conduct audits from Darmstadt. Audits were either postponed or adapted so that they could be performed remotely from Darmstadt.

The number of virtual meetings held by our employees grew significantly due to the pandemic, increasing compliance complexity as regards data privacy and IFPMA, EFPIA as well as local pharmaceutical industry code requirements. We responded by providing appropriate guidance on how to comply with international and local regulations in the fast-changing virtual environment and we are adapting our requirements and procedures accordingly.

We contributed to the fight against the Covid-19 pandemic by donating protective equipment to healthcare organizations as well as other organizations around the world. We also defined **global processes and requirements** to ensure these kinds of donations are made in line with our compliance principles as well as international and local codes and regulations.

Risk assessment

Proper compliance risk management is crucial to identify undetected risks and keep our company protected. In 2019, we rolled out a new overarching cross-sector compliance risk management process. This "**Compliance Risk Reporting & Self-Monitoring Process**" comprises two components. Compliance Risk Reporting is the component in which compliance risks are evaluated. The risk evaluation is conducted by the Compliance Officer, who determines the monetary impact and the extent to which the risk is likely to occur, starting with the inherent risk, followed by the residual risk evaluation. The self-monitoring component allows us to monitor the effectiveness of our compliance program within a business. The respective Managing Director of the legal entity or head of department is provided with specific risk-mitigating statements that must be confirmed on an agreement scale from "fully agree" to "fully disagree".

After completing the first cycle in the previous year, in 2020, we focused on the key risks identified by running different analyses and dedicated follow-up activities for risk mitigation. Additionally, we also started to run sector-specific risk assessments to highlight specific business sector risks and take a targeted approach to risk reduction that help us to continuously adjust our compliance program.

Conflicts of interest

We take all potential conflicts of interest seriously. Employees must avoid situations where their professional judgment may come into conflict with their personal interests. They must also disclose every potential conflict of interest to their manager and document the disclosure. Such issues are typically resolved directly between the employee and manager but can also be routed to Human Resources or other relevant functions.

To further enhance the existing process, a new Policy and Procedure as well as a new tool for transparent documentation of potential conflicts of interest, including decisions and mitigations taken, was rolled out in 2020.

In addition, as described in the Annual Report under "Avoidance of conflicts of interest," Executive Board and Supervisory Board members are exclusively committed to the interests of the company and neither pursue personal interests nor grant unjustified advantages to third parties.

Management and requirements of our business partners

To be effective, compliance management must not be restricted to the boundaries of our own company. While our supplier management processes focus on vendor compliance with our standards, our **global Third Partner Risk Management** process governs interactions with sales partners, such as agents, distributors, and dealers. We expect our business partners worldwide to adhere to our compliance principles. We collaborate only with partners who pledge to comply with relevant laws, reject all forms of bribery and adhere to environmental, health and safety guidelines.

We apply a risk-based approach to selecting business partners. The greater the estimated risk regarding a certain country, region or type of service, the more in-depth we examine the company before entering into a business relationship. We also explore background information from various databases and information reported by our business partners.

If we encounter compliance concerns, we further analyze and verify the existing adverse information. Based on the outcome, we decide whether to reject the potential business partner, impose conditions to mitigate identified risks or terminate the existing relationship.

Compliance forums

This year, Group Compliance reinforced compliance awareness and encouraged compliance discussions by establishing a dedicated platform for local Compliance forums or committees. This platform enables discussion of updates and alignment on certain matters in order to maintain a high standard of corporate compliance throughout the global organization. At the same time, they make it possible to **remain agile** when new business and compliance challenges arise. Group Compliance has developed them using a structured methodology framework to enhance consistency and complementation across the globe, which will further support our risk assurance. Each local forum contributes to our consistent compliance framework approach and has sufficient flexibility to cater to their local sector-specific needs.

Compliance training

We provide regular compliance classroom and online training courses on our Code of Conduct, anti-corruption, antitrust, data privacy, and healthcare compliance standards. We require employees to take these courses based on their exposure to risk. Some courses also apply to independent contractors and supervised workers, such as temporary staff.

In 2020, we rolled out two new mandatory e-learning training courses. The training courses are assigned to all relevant employees. We launched an updated version of our anti-corruption e-learning training course in 13 languages. In 2020, 28,805 employees completed the training course. We also rolled out a new money laundering prevention e-learning training course, which is available in eight languages. The final rollout took place in November 2020 and 12,829 employees completed the training in 2020.

In September 2020, we migrated to a **Group-wide learning management platform** to simplify learner accessibility.

We regularly update our training plan and adapt it to new developments to continuously educate our employees on existing and new compliance requirements, guidelines and projects.

Compliance monitoring and reporting activities

In 2020, we further enhanced our monitoring and reporting activities. Since we have different tools within Compliance, our efforts were targeted to create a single platform that displays all relevant information (KPIs and metrics for trend analysis) from the various tools. Therefore, we initiated a new governance and monitoring project that ensures a more efficient tracking of compliance-related KPIs and metrics.

Reporting potential compliance violations

We encourage all employees worldwide to report potential compliance violations to their supervisors, Legal, HR, or other relevant departments. Worldwide, they can also use our central whistleblowing SpeakUp Line **free of charge and anonymously** to report violations in their local language by telephone or via a web-based application. Reports of potential compliance violations that we receive via our SpeakUp Line are reviewed by the Compliance Investigations and Case Management team. Cases with a certain risk profile are presented to the Compliance Case Committee, which comprises senior representatives from Compliance, Corporate Security, Data Privacy, Human Resources, Internal Auditing, and Legal.

The committee's duties include assessing and classifying ethical issues, investigating their background and addressing these issues using appropriate measures. Based on the investigation outcome and recommendations from the compliance investigation team or the Compliance Case Committee, appropriate disciplinary action may be taken against employees who have committed a compliance violation. If, during the investigation, a root cause is identified that could lead to further **compliance violations**, we take preventive and corrective actions.

The SpeakUp Line is also available to external stakeholders. The relevant information can be found in the Compliance and Ethics section of our website, where we consolidate key compliance information, such as our values, Code of Conduct (CoC) and information on transparency and data privacy for external audiences.

Both the number of reports of suspected compliance violations and the number of actual compliance cases were stable compared with the previous year. In 2020, we received 81 compliance-related reports via the SpeakUp Line and other channels that **led to investigations**. There were 41 confirmed cases of violations of the CoC or other internal and external rules.

Compliance audits

As part of operational audits, our Group Internal Auditing function regularly reviews relevant matters at our sites to determine the **effectiveness of the respective compliance guidelines**, processes and structures in place. The unit also checks for violations of our CoC and our Anti-Corruption Policy and reviews the workplace requirements set out in our Human Rights Charter.

Our audit planning aims to provide **comprehensive risk assurance** through the best possible audit coverage. Our annual audit planning process is risk-based and includes factors such as sales, employee headcount, systematic stakeholder feedback, and the Corruption Perceptions Index (CPI) published by the non-governmental organization Transparency International. If an internal audit produces recommendations, Group Internal Auditing performs a systematic follow-up and monitors the implementation of the prescribed corrective actions. In 2020, we assessed 52 operations for corruption-related risks.

Alliance for Integrity

We are a member of the Alliance for Integrity Steering Committee, which was established by the German Society for International Cooperation (GIZ), the German Global Compact Network (DGCN) and the Federation of German Industries (BDI). This initiative aims to achieve corruption-free business in low- and middle-income countries. Its activities focus on Latin America, Ghana, and Asian countries, particularly India and Indonesia. The Steering Committee leads the decision-making process for developing national measures, while local advisory groups oversee implementation at country level.

Our local compliance organizations also collaborate with these groups and offer **training to small and medium-sized companies**. Beyond these efforts, we continuously assist the Alliance for Integrity through business-to-business workshops and training courses and by sharing best practices on how to develop and implement effective corruption prevention systems.

Engaging stakeholders

In 2020, we conducted stakeholder dialogues primarily through our memberships of various associations. We are members of various organizations, including the German Chemical Industry Association (VCI), the German Institute for Compliance (DICO), the European Federation of Pharmaceutical Industries and Associations (EFPIA), the German Association of Voluntary Self-Regulation for the Pharmaceutical Industry (FSA), the International Federation of Pharmaceutical Manufacturers and Associations (IFPMA), the Alliance for Integrity, the German Association for Supply Chain Management, Procurement and Logistics (BME), and the International Association of Privacy Professionals (IAPP).

data privacy

Part of the non-financial report

For a leading innovative, science- and technology-driven company such as ours, compliant handling of information is of utmost importance. When using personal data, the individuals' rights must be appropriately protected. In this regard, we strive to safeguard the rights of any person whose data we process, including but not limited to our employees, patients, customers, healthcare professionals, suppliers, visitors, and other business partners.

Our approach to data privacy

The mandate and goal of our Group Data Privacy unit is to mitigate risks and create a global framework for data privacy-compliant business operations. This unit helps to build our employees' capacity to handle data correctly and with clear accountability and it safeguards our company by providing data privacy risk assurance. Group Data Privacy also contributes to creating value for the development of digital business models.

How we ensure data privacy

Group Data Privacy is part of our global Group Compliance and Data Privacy function. As required by law, this unit acts independently. As part of our compliance reporting, it prepares **frequent data privacy updates** as well as a regular, comprehensive data privacy report. This report is part of the compliance report submitted to the Executive Board and the Supervisory Board. In addition to the Group Data Privacy unit with a Group Data Privacy Officer who reports centrally, we also have a network of Local Data Privacy Officers at various sites Group-wide.

Our goal is to establish a fully global and consistent Data Privacy Management System (DPMS) by the end of 2022. It will be based on the following three pillars: Data Privacy portfolio, people and communication. The Data Privacy portfolio will consist of eight key processes and topics broken down into 26 detailed sub-elements, thus covering all elements of a functioning DPMS in line with legal requirements and industry standards.

Our DPMS applies similar elements as the compliance portfolio but adapted to the needs of data privacy. These include policies and procedures, risk assessment and documentation, training and awareness, programs and tools, individual's requests, monitoring and reporting, incident management, and continuous improvement.

Ensuring IT security

It is essential for our business that we also protect our information systems, their contents and our communication channels against criminal or unwanted activities of any kind, such as e-crime and cyberattacks, including unauthorized access, information leakage and misuse of data or systems. Our Group Security and IT Security units maintain organizational, process-related and technical information security countermeasures based on recognized international standards. We employ **harmonized electronic and physical security measures** (e.g. access control) to bolster our ability to handle sensitive data, such as trade secrets.

Our commitment: guidelines and standards

Our Data Privacy Policy and the corresponding standards and procedures define our principles and standards for processing personal data. This approach allows us to achieve a **high level of data protection** for our employees, contract partners, customers, and suppliers as well as patients and participants in clinical studies. Our Group-wide understanding of data privacy is based on European legislation, in particular the European Union General Data Protection Regulation (EU GDPR). We also take steps to meet local data privacy requirements where these are stricter than our Group-wide standards.

Data privacy training

In line with the EU GDPR and our global approach to ensure data privacy, we regularly conduct e-learning training courses in ten languages. An update to this training course is planned for the first quarter of 2021. Additionally, Local Data Privacy Officers complement the execution of our Group-wide training plan by conducting training for specific target groups.

IT tools for documentation

We maintain a central IT tool to provide a single source for data privacy processes, such as registering data processing activities and reporting potential data privacy incidents. This tool will be redesigned in 2021. Additionally, we use our company intranet for further communication, including answering data privacy questions and providing standardized templates. We registered **no sanctioned complaints or incidents** concerning breaches of customer privacy, leaks, thefts, or losses of customer data in 2020. In three cases, minor personal data breaches were reported to the supervisory authority which were not sanctioned.

Responsible interactions with health systems

Part of the non-financial report

It is important that healthcare stakeholders, such as research institutes, healthcare professionals, patient advocacy groups, and other key players have access to up-to-date information on diseases and treatments while safeguarding their independence. We help facilitate this access by sponsoring independent initiatives and medical capacity-building programs. We also support outstanding research projects through our Global Grants for Innovation, for example. Transparency is one of our top priorities in everything we do.

Our approach to interacting with health systems

The well-being of patients is always our primary consideration when promoting pharmaceutical products, which is why we support health systems by providing information to our healthcare stakeholders, such as professional medical associations, patient advocacy groups, university clinics, and other hospitals. We follow **specific approval requirements** and procedures for each type of interaction in accordance with applicable laws and codes. In countries that have statutory or industry obligations on the disclosure of transfers of value to healthcare stakeholders, we comply with these obligations.

We adhere to all regulations concerning the promotion of pharmaceutical products. In most markets, manufacturers and distributors are permitted to advertise prescription drugs only to healthcare professionals, such as physicians and pharmacists. These promotional activities must always disclose the active ingredients, potential adverse effects and contraindications of the drug. Our internal governing documents on drug promotion are part of our Group-wide program, which requires us to always conduct business in compliance with the law, industry obligations and **in line with the highest ethical standards**. Our internal governance documents and various voluntary commitments exceed the applicable statutory regulations in many cases. We regularly review all our internal governance documents and revise them as required in response to any new developments.

We clearly differentiate between information-sharing activities (activities in which we share scientific information but not with the intention of promoting or increasing sales of pharmaceutical products) and promotional activities (activities with the clear intention of promoting or increasing sales of pharmaceutical products performed only by the Commercial organization) in line with industry standards. This differentiation implies various internal policies and standard operating procedures, responsible functions and review and approval levels, depending on the intention of the activity.

How we ensure transparency and compliance

For all engagements with healthcare stakeholders, we have established internal policies, **review processes and tools** such as record-keeping systems to ensure adherence to statutory requirements and transparency obligations.

Our Global Regulatory Affairs unit has established a dedicated policy and corresponding process document on the review and approval of our promotional materials. At the operational level, the relevant business and all employees involved in our sales and marketing activities must adhere to our internal policies and procedures.

To ensure that all promotional materials meet our standards as well as local regulations end-to-end, we apply a harmonized **Group-wide review and approval system**. In our Healthcare business sector, we use a single global software tool. This has enabled us to unify, simplify and monitor the review and approval process for promotional materials and monitor that process in accordance with the dual-control principle. If the material has promotional intent and is product-related, there is a review by medical, legal and regulatory functions. This also helps us identify opportunities for improvement.

Direct-to-consumer advertising only in certain countries

Direct-to-consumer (DTC) advertising for prescription drugs is permitted in some countries, such as the United States. In accordance with applicable local laws, we use DTC advertising in these countries to help increase people's awareness of certain diseases and the available therapies. In doing so, we empower patients to **make informed decisions** about their own treatment.

Our commitment: Group-wide guidelines and industry standards

In addition to applicable laws and our own internal standards, we comply with the codes of conduct of various industry organizations, such as the Code of Practice published by the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA) and the European Federation of Pharmaceutical Industries and Associations' (EFPIA) Code of Practice.

We are a member of the German Association of Voluntary Self-Regulation for the Pharmaceutical Industry (FSA), which has defined its own Code of Conduct for collaboration between physicians and the pharmaceutical industry.

Our Group-wide Pharma Code for Conducting Pharmaceutical Business and Pharmaceutical Operations defines the relevant general compliance for our activities in the Healthcare sector. It also governs our interactions with physicians, medical institutions and patient advocacy groups along with our promotional practices.

Our new **Standard on Medical Activities** provides the general principles and requirements that must be respected in all medical activities, including interactions with healthcare providers. The specific governance for the different

types of activities and interactions is detailed in further policies and standards, standard operational procedures and other governance documents.

We introduced new **Healthcare Ethical Guiding Principles** in October 2020 to provide our Healthcare employees with ethical guidance for decisions and activities specific to the particular challenges and responsibilities of this business sector. They complement our other policies by providing an accessible general guide for responsibility towards patients, the independence of safeguarding mechanisms, scientific integrity, responsible promotional activities, responsible interaction with healthcare stakeholders, and organizational responsibility and accountability. We have specific governance documents, procedures and tools for different types of interactions with healthcare stakeholders, covering topics, such as engagements, hospitality, payments (at fair market value) and sponsorships to participate in events.

Collaborating with patient advocacy groups

Our Policy on Interactions with Patients, Patient Opinion Leaders and Patient Organizations provides a comprehensive framework for our interactions with these key stakeholders. Our guideline entitled Good Practice and Process Guidance: Engagement with Patients, Patient Opinion Leaders and Patient Organizations provides additional guidance for our interactions with these stakeholders. It reflects our commitment to prioritizing patient well-being. Through this policy, the supplementary guideline and specific local policies, we provide a robust guidance structure to support our employees in remaining compliant throughout their interactions with patients, patient opinion leaders and patient organizations.

We seek to improve patients' quality of life, which is why we support the work of patient advocacy groups. These groups in turn provide patients, family members and caregivers with information on disease management.

Supporting medical research and education

Through our Global Grants for Innovation, we sponsor research and medical education worldwide in order to contribute to medical advances that benefit patients.

We organize non-promotional medical education programs through our Global Medical Education and Academic Organization Relations unit. We deliver these either directly as Merck Medical Education Programs or by providing grants to third-party medical education providers to fund independent and continuing medical education programs. We take an **ethical, transparent and responsible approach** aimed at providing fair, balanced and objective content, designed to allow the expression of a diverse range of theories and recognized opinions.

All requests for medical education funding are channeled through an approval process that falls under our R&D and Compliance functions, in line with our Medical Education Funding and our Merck Programs Policies. This process ensures that all funds available for medical education programs are granted according to established internal guidelines and criteria, while also complying with all applicable laws and industry codes.

We also partner with industry associations, such as Global Alliance for Medical Education (GAME), International Alliance for Continuing Medical Education, (iPACME), European Federation of Pharmaceutical Industries and Associations (EFPIA), and Medical Affairs Professional Society (MAPS). Together with these associations, we discuss how to improve and harmonize quality standards for medical education.

Transparent reporting

In 2020, we continued to publish financial and non-financial contributions that we made to healthcare stakeholders in the health industry where required according to local laws and codes. As required by applicable laws and codes, this information includes the names of individual recipients and their addresses as well as the purpose and amount of the transfer. Before publishing, we secured all necessary informed consent forms, as required by the applicable data privacy regulations.

In addition to disclosing monetary transfers of value on an individual level, we continue to **publish overall spending** on our research and development activities as required.

We **ensure transparency** on our voluntary unsolicited donations by publishing the details of contributions to European patient organizations on our website. The report is updated annually and includes all amounts, recipients and the purpose of each transfer of value, thus fulfilling our obligation as a member of EFPIA.

Regular employee training

In 2020, we rolled out our Code of Conduct-related training curriculum on dealing with **dilemmas in healthcare-specific situations** to several countries after piloting the project in China in 2019. This is a comprehensive training course that seeks to improve participants' awareness and understanding of such dilemmas, for example when overhearing a conversation that may or may not constitute attempted bribery. We plan to implement this training program in all countries where our Healthcare business sector operates.

In 2020, we also rolled out a Healthcare Ethical Guiding Principles training for our leadership teams, explaining the principles and discussing how they can be used in different scenarios. The goal is to enable our employees to make ethical decisions relating to scenarios that are not clearly defined in other governance documents, where necessary. For 2021, an e-learning course is planned for all Healthcare employees.

Employees who are responsible for the promotion of our pharmaceutical products receive regular training on current guidelines. This applies to individuals working in sales, marketing and drug registration in particular. We either conduct these seminars locally in a classroom setting or as e-learning courses.

New employees participate in **onboarding training** dealing with the review and approval of promotional materials. Additionally, employees in charge of marketing and promotion of pharmaceutical products can also access our respective guidelines via our intranet.

Relevant employees participate in mandatory e-learning courses and classroom seminars to stay up-to-date on our policies and guidelines and important changes to transfer of value reporting requirements.

Tax governance

We are aware that our company operates in a complex legal environment and incurs various tax obligations with its domestic and foreign business activities. It is our responsibility to ensure compliance with tax legislation in all countries in which we operate and to be transparent. For this we have a tax organization that clearly defines responsibilities, processes and controls.

Our approach to taxes

We believe that fair taxation serves as a backbone of any functioning society. Therefore, we expect public authorities to take transparency, predictability and non-discrimination into consideration when implementing taxation measures. We understand that tax is embedded in almost every aspect of commercial operations and our company therefore acts as a **responsible taxpayer** with respect to the following objectives:

- Ensure timely and proper execution of tax obligations;
- Secure material correctness of tax positions determined in the annual financial statements and tax declarations;
- Assure effective tax **risk management** and tax monitoring;
- Avoid inappropriate structuring leading to benefits not provided by tax law.

How we organize our tax governance

Taxes are managed in different units within Merck KGaA. Group Tax is generally responsible for tax matters of Merck KGaA and provides tax standards for the Merck Group – with the exception of customs, consumption tax and wage tax. The Export Control and Customs Regulations unit within the Group Environment, Health, Safety, Security, Quality (EQ) function is responsible for customs and consumption tax. Human Resources is responsible for wage tax. Certain tax tasks are managed by other units of Merck KGaA or Merck Business Services (MBS).

The Group Chief Financial Officer (CFO) is responsible for the Group Tax function. He delegates his tasks related to tax matters to the Head of Group Tax. The Head of Group Tax is also responsible for defining the organizational structure of the function, for monitoring it on an ongoing basis and for adapting it if necessary. Group Tax consists of five units. In addition, the local tax unit in the United States reports directly to the Head of Group Tax.

At the subsidiary level, the local CFO is generally responsible for tax matters, managed either by local tax units, by external advisors, or, for Germany and the U.S. subsidiaries, by Group Tax. The local CFOs report to the regional CFO. The regional CFO ultimately reports to the Head of MBS, who reports to the Group CFO. If no local CFO is assigned, the tasks are taken over by a designated employee in the Finance unit.

Our SpeakUp Line, i.e. our general whistleblowing system, is also open for tax topics.

Our commitment: a tax principle

Our **tax principle** is part of our tax **internal control system**. The principle represents the framework and minimum requirements for all tax-relevant processes, methods and structures within our company and:

- Outlines the tax compliance culture within the Group;
- Defines our tax compliance objectives;
- Specifies the organizational framework for tasks, roles and responsibilities, which ensures compliance with tax rules within the Group;
- Establishes basic rules for the exchange of tax-relevant information.

The Tax Principle was issued by the Executive Board and applies to the entire Group. We review it at least once a year and modify it if necessary. In case of extraordinary events, such as changes to the business strategy, organizational structures or risk management processes, the principle is reviewed on an ad-hoc basis and adapted if required. The responsibility for annual and ad-hoc reviews as well as modifications to the principle lies with the Head of Group Tax. Modifications to the principle are discussed by the Executive Board.

suppliers

supply chain standards

Part of the non-financial report

Our company procures many raw and packaging materials, technical products, components, and services from around the world. We aim to promote supply chain stability while providing our customers with high-quality products and services. We expect our suppliers to share our ethical, social and compliance standards, as set out in our Responsible Sourcing Principles, and to apply these within their own supply chains as well.

Our approach to making our supply chains more sustainable

One of the goals of our supplier management endeavors is **compliance with fundamental environmental and social standards**, alongside high-quality, reliable delivery and competitive prices. To achieve this, we have introduced relevant strategies, processes and guidelines that we are continuously improving to prevent violations of supply chain standards. To ensure supply security, we select our suppliers based on diverse criteria such as country risk, material risk, supplier risk, and business criticality. This helps our sourcing employees to identify potential mitigation actions with relevant suppliers and work on improvements.
The approach towards our **strategic suppliers,** which account for approximately 43% of our total spend, includes the identification, monitoring and assessment of supply security risks. It comprises four main elements:

1. **Supplier Risk Assessments**: to capture the overarching risks at supplier legal entity level, including multiple risk domains.
2. **Alert system:** to notify our Procurement organization when any of our suppliers faces a potential disruption.
3. **Material Risk Assessments:** to determine the risks of relevant materials that make up our most significant finished products.
4. **Risk Response Tracker:** to create and monitor risk mitigation activities.

We calculate risk factors for suppliers and raw materials by multiplying risk probability and risk impact. For the supplier evaluation, we consider 29 risk titles, including, but not limited to economic freedom, social unrest, unfair business practices, and poor labor practices. We have also included criteria for identifying supplier relationships impacted by **key sustainability risks,** such as mineral sourcing or animal welfare.

In 2020, we extended this program to include more suppliers. Additionally, we are streamlining the criteria and integrating other relevant topics in order to arrive at a more comprehensive and solid evaluation. We expect to implement this project by the middle of 2021. Amid the Covid-19 pandemic, our Procurement team also successfully secured the supply of raw materials, services and finished goods. It achieved this predominantly through effective supplier relationships.

We have developed a company-wide **due diligence process** for Responsible Supply Chains of Minerals from Conflict-Affected and High-Risk Areas, according to OECD guidance, which will integrate and strengthen existing measures used in our business sectors. A working group manages and implements this process. It comprises various business sector and Group function representatives.

We understand our approach to supply chain sustainability as a journey and are continuously working to improve and further develop our policies and processes. While doing so, we make sure that all legal requirements are considered and corresponding measures are initiated where necessary. In this context, we are closely monitoring the developments relating to a potential supply chain law and the resulting requirements.

Learn more about our efforts to reduce our scope 3 emissions in the Climate action chapter.

How we implement sustainability standards in the supply chain

Group Procurement is responsible for integrating sustainability requirements into the relevant stages of our sourcing and supplier management processes. It is a global organization with direct accountability and resources in procurement-relevant local subsidiaries. Our Center of Excellence for Supplier Security coordinates the relevant measures, such as updating our guidelines where necessary, examining processes and coordinating our participation in external initiatives. Sourcing employees responsible for selecting and contracting suppliers are aware of and regularly updated on our **guidelines and sustainability requirements** through internal communication channels and training.

In 2020, we introduced a TfS training course in Asia. We invited our Procurement employees to participate in various Ecovadis webinars. Part of the training program deals with TfS assessments and audits. In addition, we are in the process of developing a global training program for purchasers and suppliers together with TfS.

Our commitment: Guidelines and standards

We expect all our suppliers and service providers to comply with environmental and social standards, which are primarily derived from the core labor standards of the International Labour Organization (ILO) and the UN Global Compact.

Moreover, we support the Compliance Initiative of the German Association for Supply Chain Management, Procurement and Logistics (BME) and have endorsed the BME Code of Conduct. In particular, this code sets out rules for combating corruption, antitrust violations and child labor, as well as for upholding human rights, protecting the environment and public health and promoting fair working conditions.

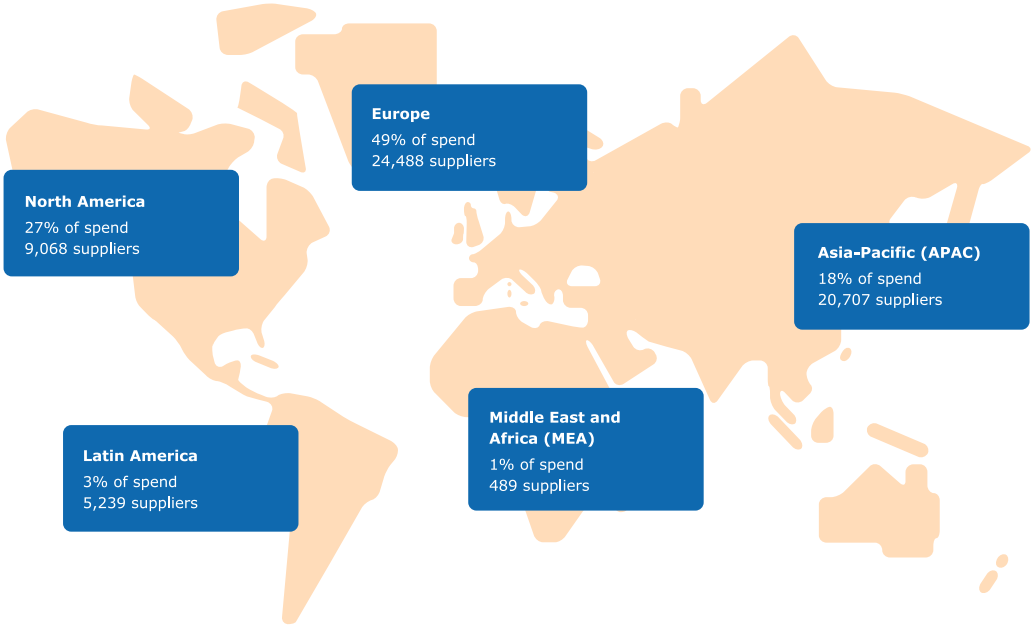
We seek to conduct our business activities in compliance with labor, social and environmental standards while also respecting human rights. Additionally, we abide by the standards set out in our Code of Conduct and our Human Rights Charter. We expect our suppliers to **comply with the labor, social and environmental standards** defined in our Responsible Sourcing Principles and to ensure that their subcontractors do the same.

We recognize that risks of significant adverse impact may be associated with extracting, trading, handling, and exporting minerals from conflict-affected and high-risk areas ("CAHRAs"). We have a responsibility to respect and safeguard human rights and not to contribute to conflicts. That's why we published our commitment to responsible sourcing of minerals from CAHRAs with our Responsible Minerals Sourcing Charter in 2020. This complements the requirements set out in our Responsible Sourcing Principles. The primary focus of the Responsible Minerals Sourcing Charter is on mined material such as tin, tungsten, tantalum, gold (also known as the "3TGs"), and cobalt sourced from CAHRAs. This Charter is also intended to cover CAHRA-related risks in other supply chains, as identified by our internal risk evaluation processes. This Charter applies to all Merck entities and subsidiaries worldwide, all Merck employees as well as any third party acting on behalf of Merck.

Global Procurement

The total value of the goods and services we purchased in 2020 from approximately **60,000 suppliers** in almost 160 countries amounted to around € 7.9 billion, compared with approximately € 7.5 billion in 2019, representing an increase of 5%. Of these (including R&D services), we purchased 27% from suppliers based in North America, 49% from suppliers based in Europe, 18% from suppliers based in the Asia-Pacific region, 1% from suppliers based in the Middle East and Africa, and 3% from suppliers based in Latin America.

Purchase volume and suppliers per region – 2020[1]



[1] For data processing reasons, 3% of our purchase volume (1,196 suppliers) is currently not assigned to any purchase region.

How we monitor our supply chain

A number of different approaches are used to keep track of our suppliers and ensure compliance with our standards and values. These are generally based on the risk the suppliers pose and combine the factors of country risk, industry risk and impact on business.

- Under the **Together for Sustainability** (TfS) initiative launched by companies in the chemical industry, we encourage our suppliers to be assessed either on self-reported information or via audits. We have been a member of TfS since 2014.
- In selected cases, we conduct our own sustainability audits of suppliers.
- Regarding our mica supply chain, we engage with a global consultancy to conduct audits and with the Indian organization IGEP to conduct inspections.

TfS supplier assessments and audits

Under TfS, suppliers are assessed either based on information obtained during audits, or based on self-reported and publicly accessible information provided by EcoVadis, an independent rating agency. EcoVadis assesses suppliers from 160 countries and 200 sectors across the four categories of **Environment, Labor and Human Rights, Ethics, and Sustainable Procurement**. The results are shared among TfS member companies in compliance with all restrictions stipulated by antitrust law. From a strategic perspective, TfS activities focus on achieving demonstrable improvements in supplier sustainability standards. In 2020, we began rolling out a new strategic framework, "Grow & Deliver", which defines TfS activities for the next five years. Our core objective is to move from measuring and monitoring to delivering a substantial positive impact in the chemical supply chain.

Through the TfS initiative, we have access to more than 1,250 valid scorecards on the assessment of our suppliers, 717 of which took part in a new assessment or re-assessment in 2020. In some cases, these were initiated by us and in other cases by other TfS members.

TfS also began a pilot for a more inclusive audit process in 2020. As a TfS member, we can use SQAS, SMETA and PSCI audits in addition to TfS audits, as they are now accepted as equivalent.

Conducting our own audits

We continuously conduct our own audits in selected cases based on business requirements. In 2020, none of these revealed indications of violations of the right of association, the right to collective bargaining or cases of child labor, forced labor or compulsory labor.

Supplier diversity

In the United States, we have a specific supplier diversity program in place to comply with regional legislation. We focused our efforts on enhancing our current supplier locator tool by broadening the rollout among sourcing managers to improve our ability to connect with and potentially award business to diverse vendors. Additionally, we are continuing to work on internal awareness campaigns and training seminars for our sourcing managers and are investing in tools to expand our small and diverse vendor database.

Ambassadors for more sustainable supply chains

Since becoming established on the social network LinkedIn in 2019, the Sustainable Procurement Pledge (a TfS initiative) has evolved to become a knowledge exchange platform for procurement professionals, academics and other stakeholders. The platform has hosted various online best practice exchange events. At Merck, we actively participate in the Sustainable Procurement Pledge.

Mica supply chain

Part of the non-financial report

Mica is an important raw material for our effect pigments, which are used in automotive, industrial coatings and plastics, as well as in the cosmetics and food industries. We procure the majority of our mica from India, specifically the north-eastern states of Jharkhand and Bihar. This region suffers from political instability and poverty, with widespread child labor. We've taken special measures to comply with our social and environmental standards.

Our approach to responsibility in the mica supply chain

In procuring mica from northeast India, we are supporting this region by safeguarding local employment and livelihoods. We source the raw material only from suppliers acting in formal working environments and monitor compliance with our standards, including our prohibition of child labor.

Our mica suppliers are informed of our standards and have confirmed that they adhere to the principles of our Human Rights Charter as well as the requirements of our Responsible Sourcing Principles. **We do not tolerate child labor** and contractually prohibit our suppliers from employing children. Hence, we are driving initiatives and taking measures to improve the conditions of mica sourcing based on our high standards. We constantly review our monitoring processes and work on improving their effectiveness.

How we organize our mica supply chain

Group Procurement has overall responsibility for sourcing mica. A steering committee is in place to involve the relevant functions and inform responsible Board members about significant developments.

We have established direct business relationships with those suppliers who handle the mica supply chain in India. Our procurement unit is in direct contact with the suppliers to reiterate the importance we place on ethical, social and environmental standards. In case of non-compliance with our standards, we work with suppliers to ensure the appropriate implementation of corrective measures.

Our commitment: Compliance with guidelines and standards

As a signatory to the United Nations Global Compact, we are actively involved in working to abolish child labor. Our Human Rights Charter underscores this commitment. In our Responsible Sourcing Principles, we set out our expectations for our suppliers in terms of corporate responsibility and human rights, including prohibition of child labor. Our Responsible Sourcing Principles are also an integral part of our supplier contracts.

Auditing our mica supply chain

We have implemented a series of oversight mechanisms through a system that monitors and audits compliance with our social and environmental standards. In addition to visits by Merck employees, regular inspections are conducted by third parties, who conduct comprehensive announced audits as well as frequent, unannounced check visits.

External audits

Environmental Resources Management (ERM), a leading global provider of environmental, health, safety, risk, social consulting services, conducts external audits of mines and processing plants, investigating working conditions as well as **environmental, health and safety issues**. The audit reports document any identified shortcomings in this respect and propose corrective actions. Our employees in Kolkata (India) and Darmstadt (Germany) then follow up to work on resolving any identified issues.

If shortcomings are not rectified, we take further action, up to freezing relations with the respective company or even terminating the business relationship altogether if necessary.

Unannounced inspections

Since 2013, the IGEP Foundation, a local non-government organization, has been arranging regular unannounced inspections to check labor standards along the supply chain. During these visits, IGEP monitors occupational safety as well as **compliance on child labor**. In 2020, the inspections focused on the availability of first aid kits with sufficient medicine, medical health check-ups for workers and health and safety training. Due to an improved escalation process, our suppliers have successfully improved the working conditions on the sites.

Tracking system for mica sources

We use a tracking system to help ensure that the mica we purchase is derived from sources **qualified by our company**, and to monitor their productivity. Based on written records of the daily extraction quantities, we review the volumes of mica reported and supplied to the processing companies.

Community outreach in the mica supply chain

The states of Jharkhand and Bihar are among the most impoverished regions in India. Together with IGEP, we are working to improve the **living conditions of the families** in the mica mining areas. The literacy rate and the number of children who attend school are far below the Indian national average, according to a study conducted in 2016 and a report published in 2018 by the organization Terre

des Hommes and the Centre for Research on Multinational Corporations.

As part of our efforts, we are funding three schools in Jharkhand run by our partner IGEP, which are attended by nearly 500 children and adolescents. In 2020, two schools introduced an eighth grade. Tailoring and carpentry courses are also offered in vocational training centers nearby the schools. In the reporting year, we also assessed the feasibility offering new options for vocational trainings such as plumber or electrician. At a fourth school run by one of our mica suppliers, we provide scholarships for 200 children out of 450 enrolled at the school.

In addition to our education efforts, we are committed to improving **local access to healthcare**. To this end, we have established a health center operated by IGEP to serve the 20,000 residents in the region. Two medical professionals work at the center and also provide regular health services to schools. This center provides an important contribution to improving the medical care of the population in the region, particularly during the Covid-19 pandemic, which continues to have a significant impact on the Indian economy and society.

Stronger together: Joint action in the mica supply chain

We are a founding member of the multi-stakeholder group Responsible Mica Initiative (RMI). In 2020, we once again held the presidency of the organization. The initiative aims to eradicate child labor and unacceptable working conditions in the Indian mica supply chain by **joining forces across industries**. During the reporting year, we continued to actively support the RMI's work on its three main program pillars:

- **Responsible workplace standards**: In 2020, RMI held training sessions on workplace standards for local businesses.
- **Community empowerment**: Building on the first community empowerment program in 2018, the RMI has expanded the programs to cover 80 villages, reaching more than 5,800 households in 2020. The goal is to address the root causes of child labor and to improve livelihoods within the local community.
- **Advocacy**: Through continuous advocacy work, the RMI is recognized as an important partner for drafting future policies to help ensure sustainable mica mining while eradicating the root causes of child labor.

In 2020, the RMI further developed its **multi-stakeholder consultations,** including representatives from processors, local authorities and non-government organizations. An important outcome of this is the "Ranchi principles," which represent a cornerstone for alignment among all key players at a local level. They are a set of principles intended to help create a sustainable mica eco-system in the Indian mica region.

The RMI responded rapidly to the Covid-19 outbreak. At the outset, the RMI funded community kitchens in the Giridih district until local authorities took over. These community kitchens supplied two meals per day, prioritizing vulnerable groups, such as the elderly, migrant workers and underprivileged families. At a later stage, the RMI organized e-consultations so that all its stakeholders were able to continue the dialog on sustainable mica.

New sources of mica

Our processes undergo constant review and improvement. We are evaluating other sources for mica according to our quality, social and environmental standards both in India and in other regions. In 2020, we obtained a considerable amount of our mica from Brazil, where we have also established oversight mechanisms to monitor and audit adherence to these standards. In addition, we manufacture effect pigments based on synthetic substrates as an alternative to pigments based on natural mica.

Human rights

As an international corporate group, we have a duty to respect human rights worldwide within our sphere of influence and to ensure that they are not compromised by our business activities. Upholding human rights is indispensable and non-negotiable for us, which is why we also expect our business partners to guarantee that human rights are respected. By meeting our human rights due diligence obligations, we fulfill our social responsibility and secure our social license to operate. At the same time, this helps us to remain competitive over the long term.

Our approach to human rights due diligence

We are committed to upholding human rights, which is why we became a signatory to the UN Global Compact back in 2005. We endeavor to reduce the risk of human rights violations as far as possible, not only at our own sites but also along our entire supply chain. That is why we are continuously integrating human rights due diligence more firmly into our business processes.

Our approach to human rights due diligence encompasses six main components.

Our human rights due diligence process

We view human rights due diligence as a **continuous process**, which we constantly adapt and improve. We closely monitor regulatory developments – for example, the National Action Plan (NAP) on Business and Human Rights of the German federal government on the implementation of the UN Guiding Principles and the planned EU directive on human rights due diligence. Regulations such as these prompt us to continually review our approach to human rights due diligence.

How we promote respect for human rights

To ensure that human rights are respected in our sphere of influence, we have defined clear responsibilities.

Our Executive Board has ultimate responsibility for human rights within our organization. The Executive Board exercises this responsibility by requiring our Managing Directors to comply with human rights.

Our Group Corporate Sustainability (CS) unit is responsible for coordinating all human rights due diligence activities and processes. Specific need for action, progress and measures are regularly discussed at CS Committee meetings. The persons responsible for these issues in the respective Group functions, business sectors and local units implement the measures decided.

The interdisciplinary Human Rights Working Group is developing **cross-functional measures** that we are using to meet our responsibility to respect human rights. This group meets three to four times per year. In 2020, it defined internal focus areas that build on our approach to human rights due diligence. Within these focus areas and based on the specific risk situation, we will implement further measures in order to better comply with human rights due diligence obligations.

Within the German Global Compact Network, we are a member of the Business & Human Rights Peer Learning Group, a working group in which we engage in dialogue with other companies to discuss challenges, current issues, experiences and successful approaches in exercising human rights due diligence.

Our commitment: guiding principles, charters and laws

Our Human Rights Charter aligns with the UN Guiding Principles on Business and Human Rights. It is our overarching human rights directive and defines the relevant requirements for our company. We expect all our employees as well as our suppliers and business partners to comply with this charter.

The charter interlinks and complements our existing rules and regulations pertaining to human rights, including, for example, our Code of Conduct, Social and Labor Standards Policy, EHS Policy (Group Environment, Health and Safety Policy), Responsible Sourcing Principles as well as the Charter on Access to Health in Developing Countries. Our standards cover a broad range of topics related to human rights. These include, for instance, product safety, occupational health and safety, equal opportunity, fair pay, freedom of association and collective bargaining as well as the exclusion of child labor.

In 2020, we also added human rights aspects to our Site Security Standard. In doing so, we want to ensure that these aspects are also included in the selection of security service providers, for instance.

In addition, we developed a Conflict Minerals Charter in 2020. This regulates responsible sourcing of minerals from conflict and high-risk regions.

Identifying actual and potential impacts on human rights

We perform **risk assessments** to understand the potential impacts our operations and business relationships could have on human rights. For instance, we investigate human rights risks at our sites as well as risks related to product and service sourcing. The following risk assessments enable us to derive the corresponding strategies and measures:

Within the scope our Group-wide Compliance Risk Reporting & Self-Monitoring process, we monitor and evaluate **compliance risks**. This has included human rights issues since 2019. In 2020, the consolidated results showed a low risk of human rights violations throughout the Group.

Furthermore, we also track human rights risks through our **strategic supplier risk process**. We plan to extend our risk assessment of the selection of new suppliers regarding modern slavery.

We are currently developing a new approach through which we aim to identify whether our **external manpower** is at risk. We are thus broadening the scope of the pilot project we conducted in 2019. Within the scope of this project, we conducted a Group-wide analysis of the work conditions of external manpower, especially in high-risk countries, such as China, Vietnam and the Philippines.

We take responsibility when **deploying new technologies** and comply with our human rights due diligence obligations. We are currently compiling an overview of the technologies we use in the company and are evaluating the human rights risks, if any, that are associated with them.

Measures to protect human rights

Auditing our suppliers and sites

We use internal audits to check whether the workplace requirements of our Human Rights Charter are being observed at our sites. More information can be found under Compliance management.

In addition, we have been reviewing human rights aspects at our sites through site security risk assessments since 2019. Starting in 2021, these will be formalized as security audits and implemented at regular intervals in line with the audit plan. The audits are one control mechanism of our security governance framework and are thus a central element of it. We derive appropriate measures from the results. This allows us to ensure that our sites meet **security-relevant human rights aspects**.

Through the Together for Sustainability (TfS) initiative, we determine whether our strategic suppliers comply with human rights standards. For selected suppliers, we conduct our own sustainability audits. To prevent modern slavery and human trafficking, we will regularly review our supplier

assessment and audit processes and are devising long-term measures together with our suppliers to this end.

Human rights and investment decisions

When projects exceed a certain cost threshold, our Investment Committee must approve the expenditure. In its decision, the committee considers various aspects related to the project, including environmental impact and health and safety. Furthermore, our Code of Conduct is binding where investment decisions are concerned. We are working to integrate human rights topics even more firmly into our decision-making process.

Creating awareness among our employees

To embed respect for human rights even more strongly throughout the company, we are expanding our internal communication and awareness training on human rights and modern slavery.

To train our Managing Directors and senior leaders reporting directly to the Executive Board, we offer an e-learning course on the requirements of our Human Rights Charter and our Social and Labor Standards Policy and the implementation thereof in their areas of responsibility. In addition, all new EHS managers took the "EHS StartUp!" onboarding course, which has been covering the topics of human rights and modern slavery since 2018. Our employees can find information about human rights on our intranet.

Training courses for our suppliers

In 2020, we introduced a TfS training course in Asia. We invited our Procurement employees to participate in various Ecovadis webinars. Part of the training program deals with TfS assessments and audits, which include compliance with human rights as an essential audit component.

In addition, we are in the process of developing a global training program for purchasers and suppliers together with TfS. This is to include training on human rights.

Transparent reporting

We use various formats to inform the public about our approaches, measures and results of human rights due diligence. We provide information on this annually in our Sustainability Report. Additionally, in the United Kingdom, the UK Modern Slavery Act requires us to publish the steps we are taking to counter forced labor and human trafficking. In 2020, we published our fourth UK Modern Slavery Statement. It has been endorsed by our Executive Board and is available on our website.

Our complaint mechanisms

Our SpeakUp Line is the most important channel for reporting complaints about potential human rights violations. Both our employees and all external stakeholders can report suspected cases in their respective national language, free of charge and anonymously, either by telephone or a web-based application. We thoroughly investigate all complaints that we receive and take countermeasures if necessary. In 2020, we noted no violations, either with respect to child or forced labor or with respect to the right to collective bargaining or freedom of association.

Bioethics

Part of the non-financial report

Bioethics guides us in how to use the rapidly advancing power of life science and the resulting technologies responsibly and ethically to the ultimate benefit of society, humans and other living beings. However, factors such as diverse cultural backgrounds have led to heated debates on divisive bioethical topics and issues arising from the explosive progress in science. In light of this situation, we feel the need to clarify our own position on bioethical approaches.

Our approach to ethical business conduct

In our work, we encounter various bioethical and digital ethics topics and issues, including animal testing and clinical research, stem cell use, the use of genetically modified microorganisms, use of health data, and the potential impact of new genome editing techniques such as CRISPR/Cas. We are strongly committed to conducting this research in an ethical manner. **Patient well-being and benefit** is always our number one priority. This applies to clinical studies as well as to treatment with our drugs and distribution of our products to academic researchers and the biopharmaceutical industry. We carefully evaluate our position on controversial topics so that we can develop frameworks and make informed decisions that meet rigorous ethical standards.

How we assess bioethics and digital ethics

The Merck Bioethics Advisory Panel (MBAP), co-chaired by two of our senior executive scientific experts, gives clear guidance on bioethical topics and issues, which steers our actions and entrepreneurial conduct. The MBAP consists of renowned external international experts in the fields of **bioethics, theology, science, and law.** The panel's composition reflects the fact that the evaluation and assessment of bioethics are strongly contingent on cultural and regional factors. The bioethical assessment of topics must be viewed holistically. The MBAP meets once per year but can also be convened on an ad-hoc basis, if required, in response to emerging urgent bioethical issues. We publish a summary of the discussions and resulting guidance from each meeting on our intranet. Our employees can ask MBAP members for advice and are able to report concerns on bioethical issues through channels such as our SpeakUp Line or by reaching out to the Bioethics Office.

Our dedicated guidance panels for genome editing and stem cell matters operate under the overarching MBAP. Using our internal guidelines as a basis, they make recommendations on issues relating to specific topics and are informed by the operational teams about the progress made with respect to implementation. Our Stem Cell Research Oversight Committee (SCROC) performs tasks such as verifying all internal research proposals that employ **human stem cells** and ensuring compliance with our ethical guidelines and any legal requirements. This also includes collaboration with external partners.

Our Digital Ethics Advisory Panel (DEAP) guides our new digital business models with an initial focus on digital health. The DEAP consists of world-leading experts in digital health business models as well as experts in ethics and medicine. It plays a pivotal role in ensuring that we develop new digital technologies responsibly and address potential digital ethics issues arising from the usage of digital technologies and data-driven business models at an early stage.

Our commitment: Identifying topics and issues early on

As a global company, it is crucial for us to promptly identify and address new developments concerning bioethical topics and issues in order to define our own stance. Although we align all our business activities with international and national legislation, many bioethical discussions raise questions that far exceed the current scope of legislators, which is why we also seek the advice of external experts.

The birth of the first babies from genome-edited embryos in China significantly challenged the field of bioethics in 2019. This breach of law, ethics and academic self-regulation led to marked global criticism. Subsequent discussions emphasized the need for profound **bioethical debate** and meaningful governance of genome-editing research in the human germline. Statements and positions were issued by the National Academy of Sciences, the Royal Society and the German Ethics Council. This led to the creation of the World Health Organization (WHO) expert advisory committee on Developing Global Standards for Governance and Oversight of Human Genome Editing. Regulation in this research field is expected to emerge in the following years.

Our Genome Editing Principle provides a mandatory ethical and operational framework for our employees. It sets clear operational boundaries for us both as a supplier of custom targeted nucleases and genetically modified cell lines, and as a user of genome editing technologies for scientific research. The principle includes background information on the topic and explains our position on genome editing. It furthermore specifically addresses the subject of human germline editing.

The Genome Editing Principle is complemented by additional principles that shape our approach to ethically conducted research and business. Our Stem Cell Principle sets the ethical boundaries for the use of human stem cells

in our research. Our Fertility Principle guides our research in fertility treatment and in-vitro fertilization by setting a clear framework for practices aligned with highest ethical standards. Our principles for disseminating information regarding the **off-label use of our products** are set out in corresponding policies that apply Group-wide.

Topics currently being addressed by our Bioethics Advisory Panel

The Merck Bioethics Advisory Panel (MBAP) convened in October 2020 to discuss important topics such as the use of genome editing tools in agriculture. We sought the MBAP's input in light of the heterogeneity of regulatory frameworks across regions along with calls to reform from the scientific community and the ongoing public controversy around genetically modified foods. The panel also addressed the sourcing of human biosamples: The need in pre-clinical development for this material is growing and requires a framework on donor consent as well as an understanding of ethical implications of its usage. Further topics of discussion included the off-label use of products and how we can provide appropriate information and obtain authorization for the treatment of children in large-scale public health programs such as our Praziquantel Donation Program (informed consent).

Our Bioethics Advisory Panel (MBAP) members

Prof. Yimtubezinash Woldeamanuel Mulate
Microbiology
Addis Ababa University
Board member and Secretary of Pan-African Bioethics Initiative

Prof. Jeanne Loring
Molecuar Biology, Stem Cells
Formerly Scripps Research Institute La Jolla
(Advisor)

Prof. Christoph Rehmann-Sutter
Philosophy, Ethics, Biology
University Lübeck
Former Chair Swiss National Advisory Commission on Biomedical Ethics

Prof. Jeremy Sugarman
Bioethics, Medicine
Johns Hopkins University

Prof. Nikolaus Knoepffler
Philosophy, Theology, Ethics
University Jena

Prof. Jochen Taupitz
Medical law, bioethics
Former Vice-Chair German Ethics Council

Prof. Daniel Fu-Chang Tsai
Bioethics, Medicine
National Taiwan University

Digital Ethics Advisory Panel

Our ethics horizon extends beyond bioethical questions. We also strive to be the "digital ethics company", adhering to rigorous ethical standards in critical areas such as health data handling. In 2019, we therefore created the Digital Ethics Advisory Panel (DEAP) to deal with all **ethical questions resulting from our Digital (Health) Businesses**, especially from the joint venture Syntropy with Palantir. It held four sessions in 2020. Together with the DEAP and additional academic partners, we currently develop a Code of Digital Ethics (CoDE). The CoDE is to serve as a guideline for our digital business models, a tool for analyzing ethical challenges, and a basis for practical DEAP guidance.

Biotechnology and genetic engineering

Across our Group, we manufacture our biotech products in accordance with the highest standards. All related activities are subject to strict statutory regulations worldwide. Compliance with these regulations is monitored by our **biological safety officers**. We continuously track local regulatory changes that relate to biotech products and adapt our processes accordingly, thus ensuring we adhere to all statutory requirements.

Using genome-editing techniques

We are a leading supplier of technologies such as CRISPR/Cas9, which can be used to target and modify specific genes, a process known as **genome editing**. CRISPR/Cas9 opens up new possibilities in genetic engineering research that could bring about major advances in the treatment of serious diseases or in "green genetic engineering", which is the use of genome editing techniques in plant cultivation. Statutes in different countries allow for a varying degree of latitude in applying this technique. Bioethical views on germline editing have been evolving for years in academic and societal discussions. Our statement on human germline editing is as follows:

> "Merck does not support the use of genome editing in human embryos and clinical applications of germline interventions in humans in accordance with the German Embryo Protection Act. Merck recognizes that there may be value of responsibly conducted related research."

Stem cell research

At the present time we neither participate in clinical programs that utilize human embryonic stem cells or cloned **human cells** for the treatment of diseases, nor do we pursue such approaches ourselves. We do, however, use human embryonic stem cells in our research and offer our customers several selected stem cell lines. Thus, our Stem Cell Principle ensures compliance with our ethical approach. All projects are reviewed and approved by the SCROC before any stem cells are used for research purposes. We only use cell lines approved by the United States National Institute of Health (NIH) and allowed under the German Embryo Protection Act and the German Stem Cell Law. The SCROC did not hold any meetings in 2020 as no pressing matters had to be discussed.

Fertility research

We develop treatments for infertility and seek to improve the success rate of in vitro fertilization. As a result, we are frequently confronted with various related **bioethical issues**. Our legislative point of reference for these issues is the German Embryo Protection Act, and we are guided by our Fertility Principle, which was developed based on input from the MBAP.

Biosampling and biobanking

Biological samples obtained from patients within clinical studies are indispensable to the development of new precision treatments and advanced diagnostic methods. We handle these samples in a responsible and ethical manner, in compliance with all regulatory requirements and according to the consent given by patients for the use of their samples. This may include the permission to use biospecimens for **further medical research** beyond the clinical study through an optional consent. Since 2017, we have had a policy and standard operating procedures in place that define our principles and processes for human biosample management during and after clinical studies.

clinical studies

Part of the non-financial report

Our company discovers and develops medicines that help people with serious diseases. Before obtaining regulatory approval, we conduct clinical studies with patients and, if necessary, also with healthy volunteers to investigate the safety and efficacy of these products. Before they begin, extensive preclinical testing must be performed to demonstrate that the drug poses no unacceptable risks. This typically includes procedures such as animal studies.

Our approach to safe and transparent clinical studies

We conduct high-caliber clinical research that always complies with applicable laws and regulations. When performing clinical studies, we adhere to the **highest ethical and scientific standards** worldwide.

We only conduct clinical studies to investigate issues that are relevant to patients, healthcare professionals or society, and only when the medicines being tested show significant therapeutic promise and have a **positive benefit-risk ratio**. In addition, a sound, established scientific methodology must be available to investigate these scientific or medical questions. We only enroll the number of participants required to answer each of the questions.

Protecting the safety, well-being, dignity and rights of the patients and healthy volunteers participating in our clinical studies is of utmost importance to us. We do not intentionally expose study subjects to undue risk or irreversible harm. **Personal data privacy** is also very important to us, and we maintain a strong focus on data protection and confidentiality, in compliance with statutory regulations.

Clinical studies in low- and middle-income countries

We conduct all our clinical studies in accordance with local laws and regulations and we adhere to all relevant international scientific and ethical standards, irrespective of the region or country. We are deliberately expanding our medicinal product development to more diverse markets in order to address pressing healthcare needs in low-and middle-income countries and support the development of their healthcare systems.

When performing clinical studies in low- and middle-income countries, where there is usually a lower level of healthcare and limited healthcare infrastructure, the following also applies:

- We only do so in an environment in which the principles of Good Clinical Practice can be upheld.
- We only investigate diseases and innovative medicines that are relevant to the local population.
- We only conduct clinical studies in countries where we expect that the drug being tested will be submitted for marketing authorization and made available to patients after we have proven its efficacy and safety.
- We assure that no subject enrolling in a clinical study is discriminated against on the basis of ethnic origin, gender or socio-economic status.

How we govern clinical studies

Clinical drug development, including clinical studies, and the related governance process are the responsibility of the Head of Global Development unit. The Head of Global Development reports to the Member of the Executive Board and CEO Healthcare.

We review the progress of new drug development at defined milestones, and make decisions about the continuation, modification or discontinuation of development, depending on the results of clinical studies.

We have established two internal committees to oversee our clinical studies. The Development Studies Committee (DSC) is responsible for the studies performed by the company on medicines that are under clinical development, while the Global Medical Decision Board (GMDB) is responsible for our own studies with approved medicines, as well as for all studies performed by independent investigators and supported by us (so-called investigator-sponsored studies). Both bodies consist of medical-scientific **experts and executives with long-standing experience** in clinical research. Our development and study teams present clinical study concepts to the appropriate committee. Each committee meets regularly to conduct a comprehensive review of the proposed concepts and ascertains that our studies are scientifically sound, have a legitimate scientific purpose and are performed according to the latest standards and best practices.

Before administering a new drug to human subjects, there must be sufficient evidence that it offers a potential **therapeutic benefit**, is sufficiently safe for use in humans and has a positive benefit-risk ratio. We only take the critical step of a first-in-human clinical trial after diligently conducting extensive preclinical testing. The decision lies with a separate committee, the Human Exposure Group chaired by our Global Chief Medical Officer.

We continuously analyze potential **risks for study participants** before and during the course of our clinical studies. Our Medical Safety and Ethics Board (MSEB) oversees the safety of subjects participating in our clinical

studies and, as necessary, reviews the benefit-risk profiles of investigational drugs. You can find further information on the MSEB under Patient safety.

Issues may be submitted to the relevant committees by product teams or other committees (as defined in relevant SOPs or committee charters). If individual employees wish to seek advice or report concerns on ethical questions, they can contact the chairperson or a permanent member of a committee directly.

Our commitment: International guidelines and requirements

Our Human Subjects Research and Development Policy provides the framework for conducting clinical studies and helps ensure that we adhere to all applicable **legal, ethical and scientific standards**. In addition to the relevant national laws and regulations, these standards also include:

- The Good Clinical Practice (GCP) guidelines of the International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH)
- The Declaration of Helsinki, published by the World Medical Association
- The Belmont Report by the U.S. Office for Human Research Protections
- Good Pharmacovigilance/Laboratory/Manufacturing/Distribution Practices (GVP/GLP/GMP/GDP)
- The International Ethical Guidelines for Health-related Research Involving Humans, published by the Council for International Organizations of Medical Sciences (CIOMS)
- The Joint Position on the Disclosure of Clinical Trial Information via Clinical Trial Registries and Databases and the Joint Position on the Publication of Clinical Trial Results in the Scientific Literature, published by the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA) the European Federation of Pharmaceutical Industries and Associations (EFPIA), the Japan Pharmaceutical Manufacturers Association (JPMA), and the Pharmaceutical Research and Manufacturers of America (PhRMA)
- The Principles for Responsible Clinical Trial Data Sharing, published by EFPIA and PhRMA, and the IFPMA Principles for Responsible Clinical Trial Data Sharing

Regular supervision of clinical studies

Our clinical study procedures are regularly inspected by the relevant regulatory authorities to verify compliance with the applicable laws and guidelines. The Covid-19 pandemic had only a minimal impact on inspections by the regulatory authorities. They continued to carry out their inspections, yet virtually.

Our Research & Development Quality unit identifies areas for auditing based on a quality risk assessment approach. We perform **quality assurance audits** internally within Healthcare R&D as well as externally among our partners (for example, at vendors' sites and investigational sites). We respond immediately to any issues found during audits by defining and implementing corrective and preventive actions to improve processes and promote compliance. Due to the Covid-19 pandemic, we paused business travel and postponed various on-site audits to 2021. We also developed virtual auditing concepts and suitable alternatives for the postponed audits.

Conducting clinical studies responsibly

Prior to enrolling subjects, every clinical trial must first be assessed and approved by a qualified **independent ethics committee**. Furthermore, all regulatory authorizations required in the respective country must be obtained. In accordance with Good Clinical Practice guidelines (ICH-GCP), all study participants must give their explicit informed consent before enrolling in a clinical study. Participants are fully informed about all aspects of the clinical trial in a language that they understand. This includes the potential risks and benefits from participating in the study and the opportunity to enquire about details. As far as possible, non-interventional (observational) studies are also assessed by an ethics committee.

Every study follows precisely defined procedures to ensure that it is conducted to the **highest quality standards** in line with good working practices for the development and manufacture of drugs (GxP), the ethical principles of the Declaration of Helsinki and other international guidelines and regulations. In 2020 there were no significant issues which had any impact on patient rights, patient safety or data integrity of a study raised by third parties or regulatory agencies.

We continuously collect and communicate **safety data on our investigational drugs** and promptly provide clinical investigators with important new findings relevant to the safety of the study participants. In this way, we help to ensure the safe use of our pharmaceuticals. Potential adverse effects and risks are taken into consideration in an effort to evaluate the benefit-risk ratio of our products and manage any risk. Product information, including the Investigator's Brochure and Information for study participants, is updated accordingly. More information is available under Patient safety.

Conducting clinical trials in vulnerable populations

The implementation of clinical studies in vulnerable populations, such as children or people with disabilities, requires **special attention and care** in order to comply with the highest ethical and scientific standards. The well-being of the individual is our highest priority. For this reason, we only conduct studies with participants from vulnerable population groups if scientifically justified and if there is no other way to achieve conclusive results. When performing such studies, especially when informing study participants and obtaining their consent, we comply strictly with all statutory regulations.

Under our leadership and in collaboration with a consortium of partners, the Pediatric Praziquantel Program has conducted clinical trials with vulnerable populations in low- and middle-income countries. Our aim is to develop, register and provide access to a **pediatric formulation** of praziquantel for treating schistosomiasis in children younger than six years of age. The program is currently in Phase III of clinical development.

We collectively designed the clinical program in line with the recommendations of the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) for pediatric development. Planning and implementation were undertaken in close cooperation with regulatory authorities and a panel of international experts, including clinicians from endemic countries. Further details can be found in the Health for all chapter.

Teaming up to get results

The clinical trial investigators participating in our clinical studies by enrolling and caring for patients are critical to the successful development of new medicines. Furthermore, in order to achieve a broad, in-depth basis for the development of new treatments, we seek advice from medical-scientific advisory boards, and frequently conduct clinical studies in collaboration with external **partners in academia and industry**. We also rely on the support of contract research organizations (CROs) and other service providers and vendors. We expect all our partners to abide by the same set of high standards in terms of ethical conduct and quality in clinical research.

As a member of TransCelerate, a consortium of 20 pharmaceutical companies, we seek to drive the **efficient, effective and high-quality delivery of new medicines.** In this context, we are currently leading an initiative to modernize clinical trials with innovative solutions such as telemedicine, direct to patient medication, home health nursing services and others.

Close dialogue with patients and advocacy groups

We want to ensure that the voices and **needs of patients and their caregivers** are adequately heard and taken into consideration when developing and conducting clinical studies. That is why we have established the Patient Advisory Boards (PAB) as one of our crucial communication channels. Our PAB Charter describes how to involve patient advocacy groups in our clinical research process. During Advisory Board meetings, patients, caregivers and representatives from patient advocacy groups are invited to share their experience and perspectives related to clinical trials. We use this opportunity to discuss multiple aspects of the drug development process, including but not limited to, protocol design, educational materials, technology and innovative approaches to clinical trials. Our Global Clinical Operations (GCO) unit values and leverages such information in multiple ways, with a clear focus on prioritizing patient centricity in everything we do.

Furthermore, we are involved in multiple activities that focus on this relevant aspect of **patient centricity in clinical studies**. For example, in the United States, we are an active member of the Clinical Trials Transformation Initiative (CTTI), which focuses on quality and efficiency in clinical trials.

Responsible data sharing

We support professional circles in advancing **medical and scientific knowledge**, thereby enabling informed healthcare decisions for the benefit of patients. Upon request, we provide qualified researchers with study protocols, anonymized patient data, study data, and clinical study reports. We share data and information in a manner that is consistent with the joint Principles for Responsible Clinical Trial Data Sharing of the EFPIA and PhRMA:

- Safeguarding the privacy of patients
- Respecting the integrity of national regulatory systems
- Maintaining incentives for investment in biomedical research

Disclosure of clinical studies and publication of results

We are obligated to disclose findings from our clinical studies. We do this publicly in a complete, accurate, balanced, transparent and timely manner, as laid out in our Clinical Trial Disclosure Policy. Our clinical study designs and results are made public in the international ClinicalTrials.gov database run by the U.S. National Institutes of Health (NIH), which can also be accessed via the World Health Organization's International Clinical Trials Registry Platform (ICTRP). Furthermore, in accordance with EU regulations, we publish results from our clinical studies in the EU Drug Regulating Authorities Clinical Trials (EudraCT) database, which is run by the European Medicines Agency (EMA). If required by local laws and regulations, we publish study results on other publicly accessible platforms. We provide clinical study report synopses and Lay Patient Summaries, which explain the results in plain language, on our clinical trials website.

We publish results from our clinical studies in **medical journals** in line with applicable laws and industry codes. In this way, we adhere in particular to the current version of the Good Publication Practice (GPP3) and follow the recommendations of the International Committee of Medical Journal Editors (ICMJE). Our Medical Publications Policy ensures compliance with all relevant standards and we use defined standard procedures for scientific publications on our products.

Our standard on clinical trial data transparency underscores our strong commitment in this matter.

Enabling early access to new medicines

Not all patients have the opportunity to take part in a clinical study and must therefore wait for a new pharmaceutical product to be approved. Through our **Early Access Program**, we can, under specific circumstances, enable patients to gain early access to new, potentially life-saving medicines. The offer is aimed at people with serious conditions who have already received all available therapies without success. It allows them to be treated with medicines that have already been clinically tested but have not yet been approved. Furthermore, we offer patients who participated in one of our clinical studies post-study access to the investigational product, provided that certain conditions are met. Here, too, we meet stringent statutory, ethical and scientific standards. By performing a thorough assessment of all available data, we ensure that the potential benefits outweigh the potential risks for patients. Position papers on early access and post-study access are available on our website.

Supporting independent human subject research

In addition to conducting our own clinical research programs and studies, we also support studies proposed by independent investigators, so-called investigator-sponsored studies (ISS). Our ISS Principle defines an ISS as "an unsolicited request for funding and/or supply of an investigational or marketed product by a third-party investigator/institution that initiates and conducts an independent scientific investigation as the regulatory sponsor". By granting **financial or material support** for independent human subject research, we seek to stimulate the advancement of clinical and medical knowledge and patient care in our therapeutic areas of interest, and to support the safe and effective use of our products. We give priority to research that is innovative and has the potential to address specific unmet medical or scientific needs. Our principles, framework and standards for granting support for ISS and for our collaboration with independent investigators are specified in our ISS Principle, which is available on our website, as well as in our corresponding policy and standard operating procedure.

Joining forces to combat the pandemic

The Covid-19 pandemic presented a major challenge for healthcare systems and clinical research in 2020. Researchers from academia, industry and supranational organizations initiated numerous research projects in an effort to find effective and safe therapies to treat Covid-19, the disease caused by the SARS-CoV-2 virus. We supported these initiatives by donating up to 300,000 units of Rebif® (interferon beta-1a) for use in Covid-19 clinical studies. This helped to enable the implementation of **three major clinical trials** with thousands of patients worldwide: the Solidarity trial performed by the World Health Organization (WHO), the Discovery trial undertaken by the French research institution INSERM, and the ACTT 3 trial initiated by the Unites States National Institute of Allergic and Infectious Diseases (NIAID). In addition, we are supporting several Covid-19-related studies performed by independent researchers. We have established a dedicated task force within our Healthcare R&D function to oversee the collaboration with independent external institutions and investigators studying Rebif® as a potential Covid-19 treatment.

We have also initiated our own Phase II randomized, controlled clinical study to evaluate the efficacy and safety of our investigational product M5049 in patients suffering from Covid-19 pneumonia. M5049 blocks the activation of two innate immune sensors that detect single-stranded RNA from viruses such as SARS-CoV-2. The activation leads to immune cell activation and inflammation, which when not properly controlled, can cause severe immunopathology. The aim of the study is to determine whether M5049 can reduce the life-threatening complications of Covid-19, including severe respiratory symptoms that often necessitate further medical interventions such as mechanical ventilation.

Managing the crisis

Soon after the news about the Covid-19 pandemic had been published around the world, it became apparent that the situation could have a major impact on our clinical research activities. First and foremost, our focus has been on the safety and well-being of the patients participating in our clinical studies and the continuity of their treatment and care.

A task force was established within Healthcare R&D in March 2020 to continuously monitor the impact of the Covid-19 pandemic on our ongoing and planned clinical studies, to guide the investigators, monitor clinical trial participants' well-being, and safeguard the integrity of our clinical studies during the pandemic.

animal welfare

In our Healthcare and Performance Materials business sectors, we conduct animal studies as part of the official drug development process and, as required by law, for chemical safety and biological quality control. Animal testing enables us to verify the safety of our medicinal and chemical products and the efficacy of our pharmaceuticals. Our Life Science business sector uses animals to, for instance, generate substances essential for in vitro methods or to generate antibodies for diagnostics.

Our approach to animal welfare

As part of our internal due diligence, all work by our company involving the use of animals was subjected to a stringent internal audit conducted from the end of 2019 to the beginning of 2020. In 2020, we adopted a new animal welfare strategy in response to the audit and the improvement potential it had identified. The new strategy aligns with our high ethical standards. It enables our company to meet the **most rigorous** animal welfare standards and to adopt a consistent and transparent Group-wide approach. We already started implementing the organizational changes and the new processes in 2020 and expect to complete this work by the end of 2021.

Our long-term ambition to replace all our animal use with non-animal alternatives is firmly embedded in the strategy. Until then, we are committed to applying the **highest ethical and animal welfare standards** related to the housing, husbandry and veterinary care of all animals involved in our work. These standards also apply to the quality of all animal work as well as related activities, such as data assessment. We ensure comprehensive **transparency** and ongoing assessment, monitoring, auditing, and improvement of all work involving the use of animals by our company and by trusted third parties. We always use as few animals as possible and replace their use whenever feasible with alternative methods. We continuously improve our animal testing processes, striving to enhance the animals' quality of life.

We subscribe to the internationally recognized **3Rs for animal-based research and have now added Responsibility as our fourth animal welfare principle**:

- **Reduction** – using the minimum number of animals required
- **Refinement** – minimizing distress or discomfort before, during and after testing
- **Replacement** – replacing animal studies with non-animal systems
- **Responsibility** – accepting the responsibility for all animals in our reach internally and among our business partners

With our internal 4Rs Award, we recognize best practice and further strengthen our commitment to apply and actively **promote the 4Rs** in our animal work. The 2020 winners were recognized for their project "Organ-on-a-chip", which stands to deliver improved, predictable and translational cell culture models for the liver and intestine and their application in the drug development process. Furthermore, we plan to hold an internal virtual 4Rs Day in early 2021.

In addition, we advocate for the global acceptance of replacement methods. To this end, we join forces with industry and academia, communicate with authorities and the public. Our aim is to launch products and processes to replace, reduce or refine the use of animals in our work.

How we ensure animal welfare

Based on our new corporate Animal Welfare strategy, which has been endorsed by the Executive Board and all Group entities, we are introducing fundamental organizational changes in line with our corporate sustainability strategy.

In 2020, we reformed our existing Animal Science and Welfare governance and set up a new Animal Affairs unit with clear roles and responsibilities. The unit will deliver a comprehensive corporate **framework of rules** and implement organizational changes and processes to enable the businesses to conduct animal testing in line with our requirements.

Within the new Animal Affairs unit, we reorganized our Animal Science and Welfare governance and sectoral compliance under four thematic pillars:

- Animal Welfare and Veterinary Care
- Vivarium Oversight
- Animal Using Vendor and Supplier Qualification
- The Group-wide 4Rs program

Our **Group Animal Welfare Council**, chaired by the Vice Chair of the Executive Board and Deputy CEO of Merck, is comprised of representatives from all our business sectors and meets at least twice annually. The council steers the Animal Affairs unit and acts as a decision-making and escalation body as needed.

Currently, all work involving the use of animals by our company is overseen by designated regional bodies or committees. As part of our organizational changes, independent, cross-sectoral and multidisciplinary **Merck Animal Usage Review Boards** will be implemented Group-wide **in 2021**. These boards will be responsible for approving all work involving the use of animals conducted by or on behalf of our company.

If employees identify an issue regarding animal welfare, they can report it directly to the **Animal Affairs** unit, to local Animal Welfare officers or via our SpeakUp Line.

Comprehensive employee training

Along with the establishment of the new Animal Affairs unit, we launched our Animal Affairs Academy in 2020. The Animal Affairs Academy will ensure regular, comprehensive, high-quality, and up-to-date staff training on practical work and governance documents.

Our employees also regularly participate in external **continuing education** programs, such as accredited laboratory animal science courses offered by the Federation of European Laboratory Animal Science Associations (FELASA), the American Association for Laboratory Animal Science (AALAS), the Society of Laboratory Animal Science, the Laboratory Animal Science Association (LASA) and the Interessengemeinschaft Tierpfleger (Community of Animal Technicians).

Work with committees and associations

As part of our efforts to improve animal welfare, we are involved in several organizations and industry initiatives, including the European Federation of Pharmaceutical Industries and Associations (EFPIA). The goal is to create efficiencies and learn from one another regarding the improvement of animal welfare. Activities include joint auditing processes, knowledge exchange and shared responsibility when phasing out animal use and fostering the approval of alternative methods.

As part of our collaboration with Interpharma, a federation of research-based pharmaceutical companies in Switzerland, we also worked with other member companies to develop a **cross-company audit concept for suppliers of animal studies and animal breeders**. The results are shared among Interpharma member companies and treated confidentially. Based on the audit results, it is up to the discretion of each company whether or not to collaborate with the respective suppliers.

Our commitment: Group-wide standards

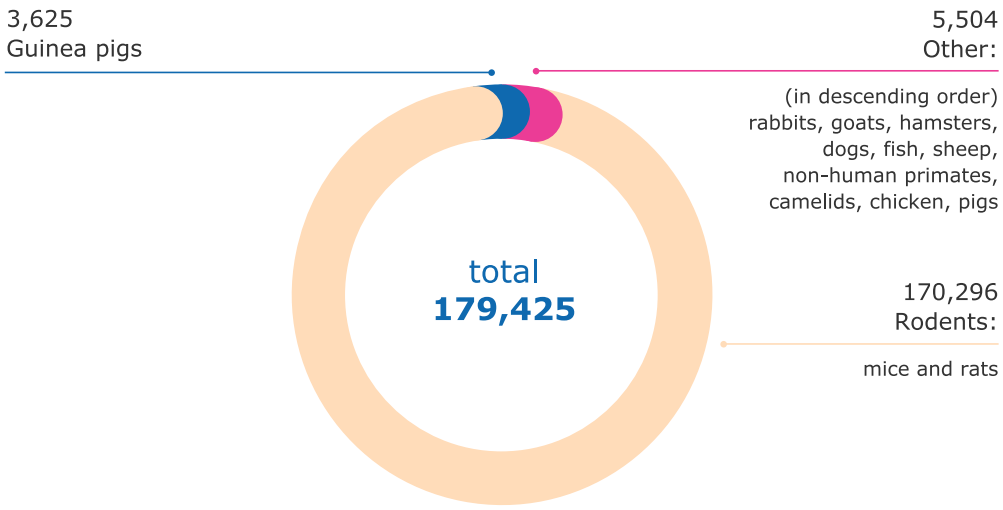
Beyond compliance with all applicable laws and regulations, we are committed to following our own internal guidelines. In 2020, as part of our strategic realignment, we adopted a new **Animal Affairs Policy** and rewrote our Group animal welfare standards and procedures for animal testing conducted internally and by trusted third parties. These guidelines corroborate a comprehensive and stringent governance framework based on our four pillars of animal use governance.

Our new standards and procedures entail, for example, the definition of housing and husbandry standards that also apply to external partners. The Animal Using Vendor Management standard describes the requirements from planning to the approval of vendors and suppliers by Animal Affairs. The standard entitled "Audit Management of Animal Affairs and of Animal Using Vendors" defines how we evaluate the quality of animal welfare practices employed in our own vivariums and by our suppliers and partners. Further documents, including guidance for our 4Rs efforts and our risk management, augment the Animal Affairs governance framework.

Number of laboratory animals used for medical study purposes

In 2020, a total of 179,425 animals were used within the scope of our business activities, either in our own vivariums or on the premises of organizations contracted on our behalf. This represents an overall decrease of 5.9% compared with 2019. Rodents (mice or rats) comprised 95% of all animals used in 2020, compared with 96% in 2019. Regulatory agencies sometimes require studies of the safety of investigational drugs in non-rodent species. This allows researchers to identify potential adverse effects accurately and include them in the risk assessment of a substance.

Animal types



Collaborating with partners and suppliers

We perform the majority (89%) of animal studies ourselves and procure the required animals from specialized breeders. We also hire CROs to conduct animal studies on our behalf. Furthermore, we work with academic institutions. Whenever collaborating with such organizations, we require them to abide by our standards.

Covid-19 and animal welfare

In 2020, it was our policy to restrict travel on a Group-wide scale as part of our Covid-19-related measures to protect our employees. Therefore, only limited audits could be performed in the reporting year. With the help of partners, we were able to perform a total of 11 on-site audits of CRO facilities. Additionally, we set up five **remote audits** by carrying out virtual facility tours either with photos or with pre-casted videos. In the future, the Animal Using Vendor governance team will perform regular audits every three years to assess all animal testing vendors.

Employee safety and animal well-being remained our highest priorities throughout the pandemic. Employees of all vivariums worked alternate shifts, for example, to reduce the number of contacts and to protect our teams. We began new studies only if they were indispensable for the business, for example to ensure the ongoing supply of medicines for patients.

products

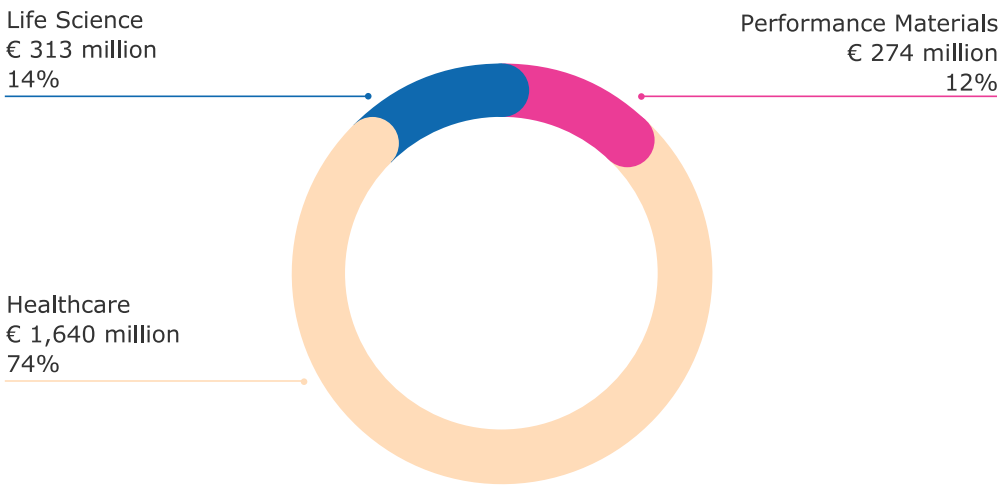
Within this chapter:

innovation and digitalization

Part of the non-financial report

We develop products and technologies that enrich people's lives. To this end, we are constantly on the lookout for groundbreaking developments and trends. Research and development (R&D) and innovation are the cornerstones of our success, enabling us to make many sustainable contributions. In 2020, we spent € 2.3 billion on R&D, corresponding to 13% of our net sales. Advances in digitalization are helping us to identify pioneering business models.

Research and development costs by business sector[1] – 2020



[1] Not represented: research and development costs of € 62 million allocated to Corporate and Other.

Our approach to creating innovation

Our business sectors use established strategies to drive new product developments for the benefit of patients and our customers. The diversity of the business sectors provides us with a **breadth of technologies** and depth of market knowledge, giving us a competitive advantage in developing new products.

At the same time, we aim to create new businesses between our business sectors and beyond the current scope of our activities. Innovation fields in which we see potential for new business provide strategic direction. In our **end-to-end innovation process**, we endeavor to identify innovation projects that transcend our current portfolio and to develop them from the initial idea to market launch. This can succeed only if our business sectors work closely together and if we are open to external momentum.

We also create and **foster an innovation ecosystem** in order to bolster our overall innovative power in several areas. This ecosystem includes a presence in Darmstadt (Germany), in Guangzhou and in Shanghai (both China) as well as in Silicon Valley (California, USA) with internal and outreach programs. Additionally, we invest in innovative technologies and transformational ideas that have the potential to shape our core business areas and our sustainability pathway.

INFO

OUR INNOVATION FIELDS TO DRIVE INNOVATION BETWEEN AND BEYOND

Clean meat

This field concentrates on the biotechnology required to produce real meat grown in vitro. It is expected to enable the production of animal protein that is healthier, more ethical and environmentally sustainable.

Liquid biopsy technologies

This area focuses on non-invasive alternatives to traditional tissue-based diagnostics, such as liquid biopsy, thereby reshaping methods of detecting and managing various diseases.

AI-enabled Health Solutions in China

Our first innovation field targeted specifically to China focuses on Artificial Intelligence (AI)-enabled Health Solutions. It includes AI-related products and services that impact the medical and healthcare industries across their value chains, for example by increasing efficiency, saving costs or improving the customer experience.

We drive promising projects from the brainstorming and idea generation stage to an incubation and growth phase, where we provide project teams with a suitable environment to develop their business models and scale up their ideas. Projects are monitored in a lean process in which they prove their commercial relevance at different stages. All activities are **supported by experts** in business model design, business development, market research, and agile methodologies. The objective is for the new products or services to make a measurable contribution to our business success once they have been launched.

Digitalization is a major focus of our innovation efforts. We leverage digital opportunities to boost business performance, and we are increasingly forming new **strategic partnerships** with organizations that offer different perspectives. In this way, we expect to accelerate our research and development activities, better manage our supply chain and broaden our existing product portfolio to include new digital services, such as our PETRA health-screening robot.

You can find more information on research and development in our 2020 Annual Report.

How we drive innovation

The organizational set-up of our research and development (R&D) activities reflects the overall structure of our company. All three of our business sectors operate independent R&D units, which pursue their own innovation strategies.

Our Group Strategy and Transformation function facilitates innovation between our individual business sectors and beyond our current business scope. It establishes an **innovation project portfolio** to generate long-term new businesses for our company. Projects of this kind are developed through our Innovation Center at our global headquarters in Darmstadt (Germany), our China Innovation Hub (Guangdong and Shanghai) and our Silicon Valley Innovation Hub in California.

Our Innovation Committee (IC) oversees the implementation of innovation projects between and beyond our business sectors. It reviews the progress of ongoing efforts and ensures that the decision-making process for selecting innovation projects is both transparent and consistent. The committee consists of leaders from our Group functions and our three business sectors. For projects requiring larger-scale investments, the IC consults our Executive Board.

Investing in promising ideas

M Ventures is our strategic corporate venture capital arm. With a € 400 million evergreen fund, M Ventures invests in innovative technologies and transformational ideas with the potential to significantly impact our core business areas. M Ventures focuses on investing in **early-stage start-ups**, including the creation of spin-offs, to leverage our science and technology orientation.

Leveraging data

We are in the process of rolling out a new Enterprise Data Strategy. Our focus is to increase the **data and analytics capabilities** across our company. To this end, we have established a consistent operating model that helps us make faster, better-informed decisions and take calculated risks based on past behaviors and future predictions. This will also help to drive innovation and research at a higher pace with strong business impact. The rollout of the strategy and the implementation of the associated organizational changes are scheduled for completion in 2021.

As a part of this data strategy, we are also investing in additional capacity for data management and data science. Linked via a global expert community, we employ several data science teams across the business sectors that drive projects in **advanced analytics and machine learning**. For example, these teams work with external and internal data to provide insights to sales teams in Life Science, use image recognition techniques to support the work of clinicians and researchers in Healthcare, and assist the research and innovation process in Performance Materials.

In the process of integrating Versum Materials and Intermolecular we have established a Chief Technology Office (CTO) to enable business innovation. The CTO will focus on identifying trends and vetting technologies that are beyond the time horizon or scope of our business units. We have also created a Technology Leadership Board to review and optimize technology investments across our Performance Materials business sector.

Our commitment: Protecting innovative ideas

We are committed to ensuring the confidentiality of sensitive information, particularly of intellectual property in

digital projects, and to protecting our innovative ideas. Our Policy for Personal Data Protection and Personal Data Privacy defines the standards that govern how we process, save, use, and transfer data.

You can find more information on data protection in the corresponding chapter.

Innovation in the fight against Covid-19

To harness our company's innovation capabilities in the fight against the pandemic, we established a cross-business Covid-19 task force. The task force launched an internal idea-generating initiative and an **external idea call** for 2020 research grants. In addition, our task force implemented multiple projects. For example, it oversaw the selection process for medicines that could be used to treat Covid-19, including Rebif® and M5049, through to clinical development and it launched an antibody detection assay.

To learn more about our clinical development efforts to address Covid-19, please see the chapter on Clinical Studies.

Easier employee testing with the help of software

We developed a software solution that digitalizes, streamlines and automates a significant proportion of the Covid-19 testing procedure for employees. The first version of the software, which is for internal use only, is focused on administration tasks associated with testing, e.g. automating e-mails, test invites and medical history. In addition, we document user consent, patient profiles, test cases, and sending out test results.

Our Innovation Center: Growing ideas into business

Located in Darmstadt (Germany), our Innovation Center offers an ideal environment to cultivate ideas and scale them up into **viable new businesses**. In addition to propelling strategic growth fields, such as our innovation fields, the Innovation Center offers a platform for serendipity. It is open to anyone at our company who has an idea that is either cross-sectoral or beyond the current scope of our activities.

For example, this kind of lateral thinking has led to a collaboration to improve the manufacturing of tablets for oral administration in clinical trials. Producing tablets for such trials is typically time-consuming and costly using the traditional tablet manufacturing processes. Through a new partnership with AMCM, a sister company of 3D printing world-market leader EOS, we are developing a GMP-certified 3D printing solution to make tablet production simpler and more flexible, saving time and costs.

Silicon Valley Innovation Hub: Accelerating the future of food

The Silicon Valley Innovation Hub is leading our Clean Meat innovation field, also referred to as cultured or cell-based meat. As a **technology enabler** for this emerging industry, we are leveraging our vast Life Science expertise in bioprocessing technologies. Apart from building strong connections and partnerships with start-ups, academia and leading organizations, such as the Good Food Institute, we are working on innovation projects to address specific technology challenges.

A major hurdle and cost driver in cultured meat production is cell culture media, which is estimated to account for 55% to 95% of production costs. For production at scale, the media needs to be cost-efficient, suitable for effective growth and differentiation into specific cell types and **free of any animal-derived material** such as fetal bovine serum. One of our innovation projects addresses exactly these challenges and aims to design and commercialize media formulations that are free from animal-derived products. Utilizing our cell culture media expertise, we partner with start-ups to enable the efficient production of various cultured seafood as well as avian and mammalian species. The project is led by the Silicon Valley Innovation Hub in collaboration with the Innovation Center and Process Solutions experts from our Life Science business sector.

China Innovation Hub: Growing the global impact of our innovation ecosystem

Our China Innovation Hub expands our innovation ecosystem to China and strengthens our global innovation impact. The China Innovation Hub leads the China-specific innovation field **"AI-enabled health solutions"** to explore future business for our global innovation pipeline.

The local presence of two innovation hubs in Guangdong and Shanghai also accelerates our innovation and digitalization development by building up a nationwide innovation network and leveraging the vibrant innovation ecosystem in China. For example, we have formed partnerships with leading academic institutions, incubators and accelerators, cross-industry players, and local governments in Guangdong and Shanghai.

Since 2019, the Merck Accelerator China program has connected us with 18 start-ups to support entrepreneurs' early-stage technologies and foster open innovation. In addition, we established a China Seed Fund of € 13 million in 2019, with the objective of strengthening our links with local entrepreneurs and investors. It **targets early innovation** generated within the Chinese innovation ecosystem. The first investment was made into SynSense, an AI-chip start-up, in May 2020.

In 2020, a series of cross-functional internal ideation programs, such as "Innovate to Fight Covid-19", inspired hundreds of employees to ideate and submit their creative ideas for new solutions. Our Innovator Academy and Innovation Salon provide training sessions on innovation approaches and idea exchanges for employees and external stakeholders, helping to empower them to transform ideas into business projects.

Synergizing external ideas

The **Merck Accelerator** supports select enterprises in their development through programs at our global headquarters in Darmstadt as well as in China. This helps us gain insights into innovative start-ups, which supports our efforts to identify emerging market trends early on. Our primary goal is to link these start-up companies with our innovation projects or our business sectors for future collaboration.

M Ventures has a mandate to invest in the areas of Healthcare, Life Sciences, Performance Materials, and Frontier Tech & Sustainability and takes an active role in its portfolio companies. One such investment example is Akili. In June 2020, Akili announced that the U.S. Food and Drug Administration (FDA) had approved EndeavorRx™ (AKL-T01) as a prescription treatment for children with attention-deficit/hyperactivity disorder (ADHD). This is the first digital, video game-based therapeutic device prescription treatment to receive FDA approval. Delivered through a video game experience, EndeavorRx™ can help to improve attention span among children aged 8-12 with primarily inattentive or combined-type ADHD.

Fruitful strategic partnership

Syntropy is a joint venture formed by our company and Palantir Technologies. The partnership's imperative is to unlock the power of data in the fight to cure cancer and several other diseases. Through its secure, trust-based environment, Syntropy enables data curation, collaboration and the generation of new insights while ensuring that data ownership remains with the provider. The partnership offers the scientific community a new model for collaboration, supporting our collective purpose to achieve breakthrough cancer research.

By simplifying and accelerating collaboration-driven insights, Syntropy will help to usher in a **new era of scientific discovery**, enabling researchers, their institutions and the scientific community to make further advances.

Promoting visionary research

At the 2020 Future Insight Virtual Event, which we sponsored, the Future Insight Prize in the Multidrug Resistance category was awarded to a team from the Technical University of Munich led by Stefan Sieber for its activities to identify new antibacterial compounds with the potential to make the multi-drug resistance breaker product a reality.

In 2020, we also offered additional **research grants** to the scientific community, focusing on four topics: drug discovery oncology and autoimmune disease, pandemic preparedness including the fight against Covid-19, bioreactor design for cultured meat, and neuromorphic computing. In total, we received more than 1,200 research proposals from around the world.

sustainable products

sustainable product design

Respect for the environment is at the heart of sustainable conduct. We see it as our duty to not only conserve resources when developing our own products, but to also help our customers increase the sustainability of theirs. Our Life Science business sector develops solutions to make research and biotech production simpler, faster and more efficient, while our Performance Materials business sector focuses on solutions for the electronics market, for example semiconductor or display materials.

Our approach to sustainable product design

Our individual business sectors take different approaches to sustainable product design. In our Life Science business sector, we aim to reduce any adverse impact of our products on health and the environment. This applies to **the entire life cycle**, from manufacture and use to disposal. At the same time, we seek to make our products more efficient and user-friendly, asking ourselves right at the start of product development how to best reconcile these requirements.

Our Performance Materials business sector develops and produces numerous smart materials that help our customers manufacture high-tech products. Many of these materials allow people to save energy in their everyday lives. The avoidance of highly hazardous materials where possible is a principle that is embedded in our product development process. Working with our customers, we support their efforts to continue advancing technology innovation while at the same time employing products with minimum environmental impact.

How we include sustainability in product design

The Life Science business sector works across its business units to drive product-related sustainability. This includes our Design for Sustainability (DfS) program for environmentally sound Life Science products as well as DOZN™, a web-based tool for assessing more sustainable alternatives.

In 2020, we started the process of restructuring the **sustainability governance** of our Performance Materials business. We will provide information on the new structure in future reports.

The responsibilities described here also apply to product packaging and recycling.

Integration of Versum Materials

We achieved several implementation milestones with respect to the integration of Versum Materials in 2020. On June 1, we announced the completion of the integration of the Human Resources processes. The next phase will focus on the structural integration of business processes and systems. This is due to be completed by the end of 2021.

Our commitment: Chemicals and product policies

In order to meet the product safety regulations relevant to our company, our Regulatory Affairs Group Policy details **Group-wide processes** for managing and implementing product safety, including the necessary management structures.

Our processes for sustainable product design

Within our Life Science business sector, a strategic platform founded on a **data-driven approach** helps our experts to drive sustainability improvement during the development of products and packaging. Our Design for Sustainability (DfS) program, a comprehensive approach to increasing the sustainability of our products, focuses on three areas:

- Our **DfS: Development** pillar focuses on embedding sustainability at the beginning of the R&D process.
- Our **DfS: Consulting** pillar focuses on working with our customers to solve specific sustainability and/or Green Chemistry challenges they face.
- Our **DfS: Re-Engineering** pillar focuses on our established portfolio of products and on looking at how we can improve the environmental footprint of these products by applying the 12 Principles of Green Chemistry in our process. We then use our proprietary web-based tool DOZN™ to assess the improvements. We have now expanded the use of this tool to our customers to aid them in assessing their own products and processes.

Within our Performance Materials business sector, our raw materials for the cosmetics industry meet the high standards of the EU Cosmetics Regulation and are produced in line with Good Manufacturing Practices for Cosmetic Ingredients (EFfCI GMP).

Ensuring business continuity during the pandemic

During the Covid-19 pandemic, our sites were fully committed to ensuring business continuity while protecting the health and safety of our employees.

The Performance Materials site in Suzhou was our first factory in China to restart operations after the Covid-19 outbreak. It resumed production on January 29, 2020. The

Suzhou site provides essential photoresist products to display panel manufacturers.

Our liquid crystal technology is widely used in the displays of vital medical devices needed during the pandemic. Globally, our Performance Materials teams work to ensure a continuous supply of high-end liquid crystal materials to support the increased demand for medical equipment.

Putting the Convention on Biological Diversity into practice

We are committed to implementing the **Nagoya Protocol**, an international supplementary agreement to the UN Convention on Biological Diversity (CBD), which has been transposed into EU law and was implemented in German law on July 1, 2016. We support the general principles set forth in the CBD, especially the third objective: the fair and equitable sharing of benefits arising from the utilization of genetic resources and traditional knowledge, in accordance with the Nagoya Protocol's terms and conditions. A key element is access and benefit sharing, which ensures that countries providing genetic resources and knowledge also benefit from their use. The Nagoya Protocol plays a key role in our product development efforts, and we apply the agreement's requirements when using genetic resources originating in countries covered by the protocol.

We employ a Group-wide standard entitled Access to Genetic Resources. Its objective is to define **requirements, roles and responsibilities** in order to ensure compliance with the Nagoya Protocol under applicable legislation. We conduct comprehensive training on this standard across relevant units. In 2020, we established an additional internal exchange within the Group to ensure continued cross-business alignment and to develop and deliver ongoing training. This keeps the relevant units informed of changes to access and benefit sharing.

Where appropriate, we seek to obtain genetic resources and traditional knowledge with the prior informed consent of the relevant Nagoya Protocol member state. Their use is governed by **mutually agreed terms**. If applicable, for instance when launching a new product, we disclose appropriate due diligence declarations and keep all associated records as required by relevant legislation.

Each business sector defines specific procedures to help ensure that the requirements set out in our Group-wide standard are met.

Sustainable product design in the Life Science business sector

Through our Design for Sustainability (DfS) program, we have developed a comprehensive approach to increasing the sustainability of our Life Science products. The "DfS: Development" program provides our product developers with a **range of tools** that enable them to analyze product impacts in terms of materials used, energy and emissions, water, packaging, usability and innovation, circular economy, as well as supplier- and manufacturing-related issues. We have developed sustainability criteria that can be used to rank a product's performance in each of these areas. When developing a new product, our aim is to improve on as many of these criteria scores as possible.

To understand the potential environmental impacts throughout the product life cycle, we conduct streamlined product life cycle analyses. The findings from these analyses inform our efforts to improve our products and are incorporated into subsequent development stages. Experts from R&D, Product Management, Quality, Procurement, and other departments collaborate along every step of the process.

In 2020, we launched the **new version** of our "DfS: Development" program. It comprises additional criteria and a new scoring system that helps our development teams to better address and minimize negative product- and supply chain-related factors and enables us to improve our communication of product sustainability credentials to our customers. We will progressively deploy these new elements across our organization.

Green Chemistry assessment tool

Through our "DfS: Re-Engineering" initiative, our Life Science researchers are developing innovative solutions in line with the 12 Principles of Green Chemistry developed by chemistry professors Paul T. Anastas and John C. Warner. These aim to make research **as environmentally compatible as possible** and to minimize negative impacts on human health.

Our proprietary web-based tool DOZN™ enables us to assess sustainable alternatives for various chemicals and to provide transparency to our customers. DOZN™ provides a **framework for rating our products** in the three stewardship categories of "Improved resource use", "Increased energy efficiency" and "Reduced human and environmental hazards". The system calculates scores on each substance based on a range of data that includes the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) as well as Material Safety Data Sheet information. To date, we have used this matrix to assess and improve more than 50 products.

The customer-facing version of DOZN™ 2.0 allows customers to compare products and/or processes in a secure environment while utilizing the power of our system. DOZN™ 2.0 brings new possibilities of sustainable product design to our customers to make **more environmentally friendly choices** in their development processes. Since its introduction in 2019, approximately 500 users worldwide have registered to utilize it.

In 2020, we established partnerships with universities in the United States aimed at applying the DOZN™ tool in both virtual and in-lab chemistry curricula. Using DOZN™ in an academic setting yields many benefits. Firstly, it increases the overall accessibility and tangibility of Green Chemistry and its principles. Secondly, it provides a practical opportunity to calculate scores for chemical products and processes and further reinforce learning while highlighting the importance of sustainability in the minds of future scientists.

As of December 2020, more than 1,100 greener alternatives had been made available across our platform of solutions.

Wide range of solutions

Our Life Science portfolio comprises a broad array of products, with different properties that are taken into consideration when applying our DfS approach. The following examples illustrate the results.

Greener solvents

Our greener, bio-based solvents use **non-food, renewable resources**, making them more environmentally sustainable. Our solvent Cyrene™ is derived from waste cellulose and is used as a more sustainable alternative to substances such as NMP and DMF, which are classified as toxic to reproduction. We were awarded € 12 million towards building a new Cyrene™ production facility in Europe by the EU research and innovation program Horizon 2020. As part of the project, we are committed to developing new applications for Cyrene™.

Beyond this initiative, we also continue to partner with leading academic institutions in order to develop innovative products that enable us to expand our green solvents portfolio.

Sustainable laboratory water use

Our Milli-Q® IQ 7000 lab water purification and monitoring system uses mercury-free UV oxidation lamps and has a hibernation mode to save energy while still preserving system water quality. Compared with previous systems, this system and its purification cartridges are 25% and 33% smaller, respectively, helping to cut down on the amount of plastic used.

Less plastic in cell culture creation

Our eco-friendlier alternative to our Stericup® sterile filtration system, the Stericup® E, allows our customers to connect the bottle containing the sample being filtered directly to the Stericup® E filtration unit, thus avoiding the use of a plastic funnel. Depending on the product version, the Stericup® E can **reduce the amount of plastic** used by up to 48% and the amount and size of plastic and corrugated packaging by up to 73%. The unit of sale is then lighter and smaller, which leads to a reduction of CO_2 emissions during transportation. It also takes less space to store the product at our distribution centers or at customers' facilities, while furthermore reducing the volume and cost of waste disposal (including biohazardous waste) for our customers. Taking the entire life cycle into consideration, this approach can reduce the global warming potential of the product by up to 46%. Stericup® E was recognized as "New Product of the Year" at the 2020 BIG Awards for Business.

Innovative single spin purification kits

Traditional DNA and RNA purification uses silica membrane columns to isolate nucleic acid from cell, tissue, blood, and other sample types. DNA or RNA are bound to silica using high concentrations of chaotropic salts. These bind-wash-elute methods usually require multiple wash and spin steps. In 2020, we launched our GenElute™-E kits, which do not contain any chaotropic salts, organic solvents or EDTA, resulting in improved performance in downstream applications. Also, the kits align with both the "Prevention" and "Designing Safer Chemicals" principles of the 12 Principles of Green Chemistry. They offer several **sustainability benefits**, such as a 55% reduction of plastic consumables (tubes, pipets, tips) and the avoidance of hazardous liquid waste compared to silica-based kits. These kits also adhere to the principles of SMASH Packaging, our global strategy to reduce the environmental impact of our packaging.

Our Performance Materials products help boost sustainability in a variety of ways:

Colloidal silica

Over the past decade, our semiconductor materials customers have been increasing their efforts to use more environmentally sustainable materials in their chip manufacturing, while simultaneously improving the performance of their computer chips at lower costs. We have responded to this challenge by developing **next-generation colloidal silica products** using at least 30% less colloidal silica. This reduces the volume of product needed, which in turn shrinks our environmental footprint.

We successfully launched a next-generation product that meets our customers' technical and commercial targets, thereby reducing the number of shipping containers used for this product line by approximately 180 units annually. We also optimized our own production process, lowering process water consumption by over 53 million liters compared to our standard products. The availability of these next-generation colloidal silica products in concentrated form means that our customers are able to reduce their process waste treatment and have a smaller number of product containers requiring disposal.

NMP-free removers

The production process for semiconductor devices requires numerous cleaning steps to remove the organic material used to pattern the circuit design. These cleaning methods require complex solvent chemistries that selectively remove organic material without damaging the sensitive electronic components. However, the most effective solvents pose a significant environmental hazard. NMP, a mainstream solvent common in wafer cleaning processes, is highly toxic and is classified as an SVHC (Substance of Very High Concern) under the European Union's REACH regulation. We are continuously working on developing **new cleaning chemistries** and launched several new products in 2020. By designing custom solvent systems for our customers' cleaning applications, we help avoid hazardous chemistries while also reducing the volume of material used and waste generated.

Switchable windows

Windows that can be darkened within a matter of seconds are possible, enabled by eyrise®, our liquid crystal window (LCW) technology. These darkened windows regulate the heat generated by direct sunlight. Estimates based on planned customer projects show that this technology can lower the energy consumed by building climate control systems and lighting by up to 10%, thereby replacing conventional shading. In addition, the people behind these

windows feel more comfortable and work more efficiently thanks to the positive effects of natural daylight. To assess societal impacts, we have developed the Sustainable Business Value method. More information can be found here.

Shifting to more natural-based cosmetics

We are working closely with our customers in the cosmetics industry to find solutions for more natural-based cosmetics. The resulting cosmetic formulations comply with strict criteria. At the end of 2020, 78 of our cosmetic pigments and active ingredients had been certified to Ecocert's COSMOS standard for organic and natural cosmetics. We had also obtained **halal certificates** for over 90% of our cosmetic products, including a significant proportion of the pigments we produce in Gernsheim (Germany) and Savannah (Georgia, USA) by the end of 2020.

Alternatives to microplastics in cosmetics

Functional fillers play a crucial role when it comes to the look, feel and quality of cosmetics. Microplastics are often used in cosmetics and functional fillers. However, they are highly resistant to environmental biodegradation, fragment into ever smaller pieces and do not dissolve in water. Wastewater treatment plants are able to filter out only 90% of microplastics.

We offer effective and scientifically proven alternatives to microplastics. Our RonaFlair® portfolio of functional fillers offers environmentally friendly mineral ingredients that deliver a variety of cosmetic properties.

packaging and recycling

Packaging protects our products from external influences and helps to ensure that they reach the customer undamaged. We are working to reduce the amount of material we use while also employing more eco-friendly materials. Furthermore, we help our customers take a more sustainable approach to recycling or disposing of our products and packaging.

Our sustainable packaging strategy

We aim to deliver our products in packaging that is safe and easy for customers to handle. We also work to make it as sustainable as possible. With more than 300,000 products in our Life Science portfolio – ranging from biochemicals to lab chemicals, from filter materials and systems to instruments – we face a variety of challenges when it comes to packaging. We strive to improve the sustainability of this packaging to help both us and our customers reduce its environmental impact. In 2019, we therefore launched SMASH Packaging, a sustainable packaging strategy for Life Science. The strategy is built on three pillars: optimizing resources, using more sustainable materials and designing for a **circular economy**. We have set four goals that support these pillars.

- **Shrink**: reduce amount of packaging
- **Secure**: achieve zero deforestation
- **Switch**: improve plastic sustainability
- **Save**: maximize recycling

Based on these goals, we have defined targets for the years up to 2022. They address the development of new product packaging and the improvement of existing product and distribution packaging.

New product packaging is where we can achieve the greatest impact. Our approach consists of implementing **new standards and guidelines** that development teams can apply to create more sustainable packaging. Going forward, we will assess the sustainability characteristics of new product packaging based on our Design for Sustainability scorecard, which was redesigned in 2020.

Our specialty gas and thin films businesses in Performance Materials focus on product packaging that performs well in terms of transportation and handling safety. When introducing new packaging, we use a process that includes a safety review, evaluating package specifications and sizes, shipment frequency, route, carriers, emergency response capabilities, and elements of safety in the supply chain. All product containers undergo a review for chemical compatibility, purity, leak-tightness, and regulatory compliance. The presence of specific hazards and specific container sizes can necessitate a more detailed risk assessment.

Making product packaging more sustainable: Life Science

Within the scope of our SMASH Packaging sustainable packaging strategy, we are pursuing a number of projects for the Life Science business sector:

How product design affects packaging: ZooMAb®

Most traditional antibody products need to be shipped at temperatures between 2°C and 8°C, using specific insulated shipping containers with wet ice bricks. This results in high packaging material consumption and transport emissions. Our ZooMAb® antibodies were developed as a freeze-dried product, giving them improved ambient shipping capabilities and storage stability. This makes it possible to eliminate the use of polystyrene coolers and ice bricks, resulting in significant packaging weight reductions for product shipments. Based on current projections, this will allow us to avoid the emission of 75 metric tons of CO_2eq per year by 2025.

Shrink: How we minimize the amount of packaging

We seek **eco-friendly alternatives** to ship our products safely, which is why we partnered with a biotech company and jointly developed a more sustainable bulk packaging design for the transport of our Millistak+® Pod Disposable Depth Filters. A life cycle assessment showed that we achieved a 24% reduction in the corrugated cardboard used, which translates to a 17% decrease in greenhouse gas (GHG) emissions throughout the life cycle of the packaging materials. In 2020, we saved around 12 metric tons of corrugated cardboard. Moreover, our customers require 70% less time to open and then dispose of the packaging.

Our distribution teams in Germany and India continue to benefit from optimization projects that we conducted in 2019. At our distribution center in Darmstadt (Germany), we reduced the grammage of kraft paper used as packing material from 100g/m^2 to 80g/m^2. This initiative allows us to save 14 metric tons of paper annually while maintaining the **same level of performance** in protecting our products.

Secure: How we are moving towards zero deforestation

A large proportion of our packaging consists of fiber derived from wood. As part of our SMASH Packaging strategy, we have set a goal that none of our wood or fiber-based packaging materials contribute to deforestation.

We assess the practices of our suppliers and the characteristics of our packaging annually in order to measure our progress towards our zero deforestation ambitions. This also enables us to identify opportunities to increase the volume of recycled material and the percentage of packaging we use with **sustainable forestry certifications,** which are awarded in line with sustainability standards developed by the Forest Stewardship Council (FSC), the Programme for the Endorsement of Forest Certification Schemes (PEFC) and the Sustainable Forestry Initiative (SFI).

In 2020, we collected information from our strategic suppliers who represent 85% of our fiber-based packaging materials spending. Overall, by volume, around 80% of corrugated packaging supplied by these companies is certified by at least one of the three sustainable forestry standards or are made of recycled material. We have also initiated several projects to obtain sustainable forestry certification for a further 1,000 metric tons of our corrugated and paperboard packaging.

Switch: How we substitute plastics

In the past, we used insulated containers made of expanded polystyrene (EPS) for the shipment of our chemicals in glass bottles and our temperature-controlled products. While EPS offers good insulation and cushioning properties, it is a petroleum-based material that takes hundreds of years to decompose As the options for recycling EPS are limited, it is generally incinerated or landfilled. Our goal is to **reduce our use of EPS by 20% by 2022**.

We are replacing EPS wherever possible with molded components made of cellulose and recycled paper pulp. Our molded pulp components can be easily recycled with other paper materials and **compacted together** for storage and transport. We use molded pulp inserts to pack a variety of liter bottle configurations in shipping boxes, thereby replacing around three million EPS parts per year. We are currently conducting safety tests on new pulp designs for shipping other bottles of various sizes.

In 2020, we began implementing an alternative cooler at one of our distribution centers in the United States. This cooler is made from renewable resources and is certified as recyclable with corrugated materials. We use it to ship products with wet ice at temperatures of 2°C to 8°C. We plan to progressively deploy these new coolers in our key North American distribution centers.

Aqueous solutions are usually supplied in plastic bottles. We use Titripac® because it offers an eco-friendlier alternative. The cardboard carton and plastic liner with an integrated withdrawal tap have made the packaging lighter and more recyclable. Since the withdrawal tap protects the product against contamination, contents can be used to the very last drop. This helps reduce chemical waste. In 2020, our products sold in Titripac® 10L packaging configuration allowed to avoid 16 tons of non-renewable packaging materials, resulting in a reduction of 75 tons CO_2eq emissions across the life cycle of the packaging compared to 1L plastic bottles.

Save: How we maximize recycling of packaging

Many of our Life Science products need to be kept cool during shipping and are therefore packed in special EPS boxes. To **mitigate waste**, we offer our customers in the United States the option of returning these boxes to us. If they are still fully functional, we reuse them. In 2020, this amounted to approximately 8,000 boxes that were reused at least once, making it possible to save 1.8 metric tons of EPS.

Expanding product recycling

In cooperation with a waste management company based in Massachusetts (USA), we offer a comprehensive recycling program to our Life Science customers in the United States. Product waste from research labs and biopharmaceutical manufacturing operations is collected, sanitized and **recycled into plastic lumber**. This material can be used in many industries, such as landscaping, transportation and marine construction.

We continue to expand this program throughout the United States while exploring new options and recycling technologies in other regions such as Europe and Asia. It now serves 14 major biopharma manufacturing customers. Our goal was to recycle 5,000 metric tons of single use plastic through the program by 2020. Since launching the program in 2015, we have recycled more than 5,200 metric tons, exceeding our goal and avoiding the emission of approximately 3,385 metric tons of CO_2eq.

Making product packaging more sustainable: Performance Materials

Our Performance Materials business sector uses a variety of packaging types, each tailored to the specific needs of the individual business fields and with its own unique sustainability characteristics.

Reusable packaging

Packaging for our specialty gas and thin films products is designed to be reused. Reusable packaging types include various sizes of cylinders and tube trailers for bulk specialty gases, along with smaller stainless steel and quartz containers for thin films. Once our customers have used the product within the container, the spent containers are returned to our production facility for cleaning, refurbishment and refilling. This cycle greatly reduces the number of containers to be disposed of. It diminishes the demand for construction of new containers and the subsequent resource needs, thus moving us **closer to a circular economy**.

Recyclable packaging

For large quantities of products in our planarization business, we use totes for packaging. Totes are typically constructed of high-density polyethylene. One of our main tote suppliers has a recycling program in place that our customers can also use. Each tote from this supplier has a return ticket attached to it, and the supplier picks up the used tote so that its parts may be reused or recycled.

Health for all

Global strategy

At least half of the world's population still does not have adequate access to health. We are striving to make health solutions affordable and accessible, raise awareness of diseases and help people learn how to manage them. We work with committed partners to tackle this complex challenge by researching innovative solutions, developing new approaches and improving existing programs to help people at the point of care.

Our approach to improving healthcare for underserved populations

Our overarching aim is to create a healthier future for all. We use innovation in science and technology to also help improve the health of underserved populations in low- and middle-income countries. To achieve this, we leverage our expertise from all business sectors and collaborate closely with a wide range of partners. We also participate in industry-wide initiatives to develop new approaches.

Our **Global Health strategy** focuses on the elimination of schistosomiasis and malaria as public health problems, and the prevention and control of non-communicable diseases, such as diabetes and hypertension in low- and middle-income countries.

The strategy is designed to overcome access barriers for underserved populations and communities in those countries in an economically viable and sustainable way, thereby creating shared value. For us, this means developing business models that increase the value and competitiveness of our company by **solving unmet health needs** and strengthening local health systems.

We follow three core operating principles:

- **Developing innovative solutions:** We play a leading role in the elimination of schistosomiasis and we create new, integrated drugs, diagnostics, technology, and vector control solutions for schistosomiasis and malaria.
- **Engaging with cross-sector partners:** We participate in multi-stakeholder global health platforms to help achieve the UN Sustainable Development Goals. We define partnerships for research and development programs, utilize access alliances, and create opportunities based locally.
- **Creating business opportunities via a shared value approach:** We help to sustainably improve the health of underserved populations using our portfolio from across all three of our business sectors.

Using focus programs to address our priority areas, we aim to play a key role in improving health as a leading and reliable partner. In particular, by building capacity across the value chain, we intend to strengthen healthcare systems, making them more resilient to health crises.

Our **Access to Health strategy** comprises four pillars that guide our access activities:

- **Availability**: We research, develop and refine health solutions that address unmet needs, tailoring them to local environments. For example, we are committed to delivering our R&D portfolio of projects by developing and providing access to innovative products and technologies that help tackle infectious diseases.
- **Affordability**: We seek to provide assistance to those who are unable to pay for the health solutions they need, for example through our patient access programs. This assistance also includes addressing challenges regarding pricing and intellectual property. Furthermore, we are working on innovative and sustainable access paths for health solutions to fight NTDs. For instance, we aim to ensure the affordability of our new pediatric drug to treat schistosomiasis in children under six years old.
- **Awareness**: We empower healthcare professionals, communities and patients to make informed decisions and we help raise awareness for diseases and therapies through efforts such as our global awareness campaigns.
- **Accessibility**: We promote initiatives that control the cost of goods during product development and production and enable localized health solutions. We also strive to strengthen our supply chains to ensure that medicines reach the people who need them quickly and safely, as demonstrated by our NTDeliver project.

How we are improving access to healthcare

Our Global Health unit leads the implementation of our strategy regarding innovative solutions for infectious diseases and for global access to healthcare. This unit is also responsible for Group-wide initiatives, programs and sponsorships relating to global health topics. Our experts collaborate closely with the Healthcare, Life Science and Performance Materials business sectors to leverage their strengths and competencies effectively. By **delivering high quality health solutions**, we seek to create long-term value for the business, our stakeholders and society.

The Merck Schistosomiasis Elimination Program guides our efforts to eliminate schistosomiasis in **close collaboration with external partners**, such as the World Health Organization (WHO). Since 2007, we provided more than one billion tablets to WHO for the treatment of schistosomiasis. The donation is a major part of the integrated and coordinated approach we adopt towards treating and eliminating schistosomiasis.

Our Global Health Institute translates science, technology and digital approaches into integrated solutions to strengthen health systems. This means we develop and implement a portfolio of projects for transformative treatments, diagnostics, technologies, and preventive measures against infectious diseases, especially schistosomiasis and malaria. The institute also engages in science and technology activities with local experts. It operates as a social business enterprise to deliver new solutions for the most vulnerable members of society.

Our Access to Health strategy aims to address the health system gaps that prevent underserved populations from receiving healthcare. We coordinate with multiple partners to identify and develop solutions, such as sustainable access business models. This approach applies to neglected and non-communicable diseases in low- and middle-income countries.

Our commitment: Providing a solid basis for access to healthcare

Our commitment to expanding access to healthcare is summarized in our Access to Health Charter. It sets out the following guidelines on:

- Our approach
- Pharmaceutical product donations
- Fake medicines
- R&D for infectious diseases
- Pharmaceutical product pricing
- Intellectual property rights

Every two years, the Access to Medicine Foundation publishes the Access to Medicine Index. It benchmarks 20 of the world's largest research-based pharmaceutical companies on activities and initiatives that experts consider most relevant for access to medicine in low- and middle-income countries, ranging from Research & Development and Intellectual Property sharing, to capacity building and donations. We use the ranking to inform and guide our access to health strategy and approach.

The Foundation revised the Access to Medicine Index methodology in 2020. The latest Index was published in January 2021. We came in eighth place (previously fourth place). Our position among the top ten confirms our continuous commitment to improving sustainable access to high-quality solutions for all. The ATM Index for 2021 **recognized us for our performance in Research & Development**, where we ranked fifth. Our leading role in Intellectual Property sharing also received accolades.

We remain committed to the objectives of the London Declaration on Neglected Tropical Diseases (NTDs), through which participating companies, governments and private organizations promise to help control and ultimately eliminate the top ten most prevalent NTDs. We are engaged in the fight against schistosomiasis.

We are a member of the Business for Social Responsibility (BSR) initiative and endorse the BSR Guiding Principles on Access to Healthcare, which provide a framework for us to refine and enhance our Global Health efforts.

Fighting the global Covid-19 pandemic

The Covid-19 pandemic is having a substantial impact on low- and middle-income countries. The health systems in several of these countries are already struggling with the dual burden of infectious diseases such as schistosomiasis and malaria, and the rising incidence of non-communicable diseases such as diabetes and hypertension.

Our Global Health unit spearheads a considerable variety of initiatives to combat the virus and its effects on the world's most vulnerable countries. These efforts include direct measures, such as the donation of masks and protective equipment to Cameroon, Ethiopia and Tanzania, as well as more sustainable initiatives, e.g. in Ghana and Senegal, that **strengthen the overall resilience of health systems** against the current and future health crises. Read more about our contribution to this global challenge here.

Partnering to build the resilience of health systems

The private sector is a critical partner in responding to global health threats, such as the current Covid-19 pandemic. Beyond developing novel health solutions, we must ensure that health systems are prepared to address emergencies effectively and deliver care to people in need. We aim to sustainably strengthen prevention, preparedness and resilience of health systems in low- and middle-income countries. Our efforts entail the following aspects:

- **Employing innovative technology** targeted to prevent schistosomiasis and malaria and to improve local health-related capabilities
- **Increasing country crisis preparedness** by creating scientific and healthcare workforce competencies and capacity through a network of experts
- **Optimizing the monitoring and evaluation** of health initiatives at country level through data-processing and digitalization

We apply this approach in our R&D collaborative programs that build local expertise and capacity, as well as in our health educational initiatives with our local partners, primarily in and for several African countries.

Learn more about our focus programs here.

Engaging stakeholders

Partnerships and dialogue are vital to improving access to healthcare. Our partners include multinational organizations, government agencies and NGOs, as well as academic institutions, health industry associations, companies, and independent global health experts.

Alliances for better access to health

Together with 21 other leading pharmaceutical companies, we host the global Access Accelerated initiative, which seeks to improve both the treatment and prevention of non-communicable diseases in low- and middle-income countries. We also joined forces with advocacy groups, such as the Swiss Malaria Group and the Swiss Alliance against Neglected Tropical Diseases.

The Merck Access Dialogue Series is a multi-stakeholder platform for sharing information and **exchanging best practices** on broadening access to healthcare. The shared ideas inform and drive our access strategy, plan of action and engagements.

Discussions at a global level

In 2020, we continued to engage with key stakeholders to advance global health discussions and address shared challenges such as infectious diseases. We also deepened **collaborations with the scientific community** through publications and patents as well as by taking on active roles at international, largely virtual, events.

For example, we were panelists in a series of World Health Organization webinars on neglected tropical diseases that flanked the publication of the new NTD roadmap. The webinars were devoted to the topics of innovation and the power of partnerships. We also engaged into the annual meeting of the Coalition for Operational Research on Neglected Tropical Diseases (COR-NTD), fulfilling our role as a leading and reliable partner in the fight against NTDs by providing scientific contribution to the discussions. We were on stage at the Geneva Health Forum to talk, together with our partners, about open innovation to combat infectious diseases.

Focus programs

Neglected tropical diseases occur almost exclusively in impoverished populations in low- and middle-income countries. Hardly known in industrialized nations, they attract little public attention or research funding. One example is schistosomiasis. Our aim is to eliminate this neglected disease as well as other, more familiar infectious diseases such as malaria.

Strategy for preventing and treating infectious diseases

Our strategy focuses on the elimination of schistosomiasis and malaria. To implement our strategy, we develop and provide medicines, improve diagnostics, counter disease transmission, increase disease control, expand access to healthcare, conduct awareness programs, and strengthen local health systems.

Our fight against schistosomiasis

Schistosomiasis, also known as bilharzia, is a tropical disease caused by parasitic worms and one of the most prevalent parasitic infections in Africa, placing a significant burden on public health and the local economies. The disease affects almost 240 million people worldwide, with more than 90% of cases occurring in Africa. An estimated **200,000 people** die every year from long-term effects of schistosomiasis, such as liver and kidney infections, bladder cancer, genital schistosomiasis, and anemia. School-aged children are particularly vulnerable to the disease and often suffer from the long-term consequences and complications, including anemia, stunted growth, and learning difficulties.

Our ultimate aim in all our schistosomiasis-related work is to eliminate the disease as a public health problem. To achieve this goal, we adopted an integrated schistosomiasis strategy that we are implementing in close collaboration with multiple partners worldwide. The approach focuses on five pillars to ensure progress:

- **Treatment:** We donate up to 250 million tablets of praziquantel per year to endemic countries in partnership with WHO. Nearly 50 years after its development, praziquantel still remains the standard of care for the effective treatment of schistosomiasis around the world.
- **Research and Development (R&D):** We advance R&D to support the global fight against schistosomiasis. In particular, we drive collaborative R&D programs for innovative treatments, including a new, pediatric formulation of praziquantel for children under the age of six, more sensitive diagnostics, and vector control methods. We also strengthen research expertise and capacity through collaborations with local institutions in endemic countries.
- **WASH** (Water, sanitation and hygiene)**:** Since schistosomiasis is transmitted through contaminated water sources, we also support WASH projects that aim to prevent transmission of the disease through the provision of sanitary infrastructure and new access-to-water technologies.
- **Health education:** We invest in education and behavior change initiatives that raise awareness of the causes and dangers of schistosomiasis and teach people how to prevent it.
- **Advocacy and Partnerships:** Collaborating with partner organizations for our programs and initiatives, as well as with the wider stakeholder community through the Global Schistosomiasis Alliance (GSA), we are accelerating the progress towards schistosomiasis elimination.

Our fight against malaria

According to World Health Organization (WHO) estimates, nearly half of the world's population is at risk of contracting malaria. More than **200 million cases of malaria** and over 400,000 related deaths are recorded every year, with almost 70% occurring in children under the age of five. Over 90% of cases and of deaths occur in Africa. Every two minutes, a child dies from the disease.

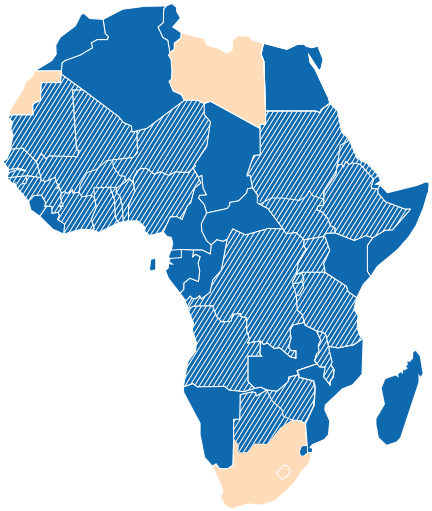
There is a need for new products to overcome the problem of increasing drug resistance and to achieve our goal of elimination. Through our "As One against Malaria" program, we are helping to deliver integrated and sustainable health solutions entailing treatments, diagnostics and prevention methods to fight malaria in endemic countries.

Schistosomiasis: Over one billion tablets donated

As part of our long-standing partnership with WHO, we are committed to donating praziquantel tablets annually. To date, our tablets have been distributed in 47 endemic African countries to treat school-aged children. In 2020, we donated around **226 million tablets** for distribution in 30 countries, 27 of which are in sub-Saharan Africa. Moreover, we maintain our commitment by ensuring that we have sufficient production capacity to manufacture up to 250 million tablets a year.

Countries that have received donations of praziquantel tablets

Since 2007, we have donated over **1.3 billion** tablets of praziquantel, which is enough to treat around 520 million school-aged children.



African countries that have been receiving tablet donations from us since 2007*.

African countries to which we also donated tablets in 2020.

Countries that have received no donated tablets to date.

* Launch of our Praziquantel Donation Program.

Schistosomiasis health education project

In 2020, we extended our partnership with the NALA Foundation for another three years. This joint health education project focuses on southwestern Ethiopia and is aimed at promoting long-term behavioral change in the drive to **eliminate schistosomiasis** and other neglected tropical diseases. WASH measures play a crucial role in these efforts. Our local partners conduct training sessions in schools and among local communities. The majority of participating schools have established hand-washing stations: Safe water and latrines are now available in these stations throughout the school year, and teachers also report major improvements in students' personal hygiene and general levels of cleanliness in the schools.

The GSA: A central platform in the battle against schistosomiasis

The Global Schistosomiasis Alliance (GSA) is a coordinated, multi-sectoral effort to combat the complex disease schistosomiasis. The GSA continues to help eliminate the disease through its working groups and to raise awareness through coordinated campaigns. In November 2020, the World Health Assembly endorsed a new WHO road map that "sets global targets and milestones to prevent, control, eliminate and eradicate 20 neglected tropical diseases and disease groups" for the time period from 2021-2030. The GSA contributed to WHO consultations during the roadmap conception phase.

Partners in schistosomiasis research

Over time, we have developed a portfolio of R&D projects on schistosomiasis. These include making a new child-friendly pediatric formulation of praziquantel available to treat children under the age of six, identifying new drugs to prevent and treat schistosomiasis, developing innovative and highly sensitive **schistosomiasis diagnostic methods**, and defining new technologies for safe water access and approaches for vector control.

If left untreated in children of **preschool age**, schistosomiasis can have long-term effects such as anemia, stunted growth and impaired learning. It can seriously affect their lives and potentially cause chronic diseases, including bladder cancer or female genital schistosomiasis. Together with the Pediatric Praziquantel Consortium, we develop, register and provide access to the pediatric formulation of praziquantel. Consortium partners include both public and private sector representatives from developed and endemic countries to ensure that the strategy and implementation meets local requirements and needs.

The program is currently in Phase III clinical development. The pivotal trial is designed to evaluate the efficacy and safety of the new **pediatric praziquantel ODT (orodispersible tablet) formulation** in children three months to six years of age who are infected with schistosomes. The trial is taking place in Côte d'Ivoire and Kenya, and is co-funded by the Consortium, the European & Developing Countries Clinical Trials Partnership (EDCTP), and the Global Health Innovative Technology (GHIT) Fund. The study represents the last step of the clinical development program and is designed to support registration and market authorization for this important new treatment for very young children. Due to the Covid-19 pandemic, the study needed to be paused in line with national restrictions.

Meanwhile, together with international key stakeholders, we are defining an innovative procurement access path, including local manufacturing, to ensure the future affordability, availability and adoption of the new medicine.

Praziquantel is an effective and well-tolerated drug, but it is not effective in all developmental stages of the parasite. We continue to collaborate on research activities with many partners. This work aims to discover new, long-lasting compounds to **treat juvenile forms** of the parasite, thereby improving efficacy and preventing reinfections. In 2019, we obtained promising assets from Salvensis and the London School of Hygiene and Tropical Medicine. We have since worked to identify potential new candidates for preventing infection and curing patients affected by schistosomiasis. In 2020, we identified a lead molecule for further

development to potentially serve as an alternative to praziquantel.

The need for **more sensitive diagnostics** is crucial in the fight against schistosomiasis. Since early 2019, we have been collaborating with the Foundation for Innovative New Diagnostics (FIND) to develop a sensitive rapid diagnostic test (RDT) to improve mapping and case detection for schistosomiasis. Building on the prototype, a consortium of partners was formed in 2020 to accelerate the development.

In 2020, we entered into a strategic alliance with Janssen Pharmaceuticals Inc. to develop an artificial intelligence-based diagnostic tool to improve the diagnosis of neglected tropical diseases, schistosomiasis and soil-transmitted helminthiasis (STH).

Beyond these efforts, we continue to explore technologies that control transmission factors through basic research activities, for example the elimination of the infectivity of snails through gene editing, or through an access-to-water program in Senegal. In partnership with the Access to Water Foundation, we intend to provide innovative safe-water platforms to local communities and health centers, in order to improve sanitation and reduce exposure to parasites. Details can be found under Community Engagement.

We also continue to implement research and advocacy initiatives to address female genital schistosomiasis (FGS), a major challenge to women's health in Africa, and its impact on HIV/AIDS. In particular, we supported a clinical trial to **optimize therapeutic treatment for women** suffering from FGS in Madagascar, with results expected in 2021.

Malaria: Developing new therapeutic solutions

As part of our "As One against Malaria" program, we are developing a new drug (M5717) for the prevention and treatment of malaria. In 2020, we initiated a Phase Ib clinical trial (for prevention) to test efficacy of the compound in the liver/first stage of infection in healthy volunteers.

The World Health Organization (WHO) recommends that new drug therapies against malaria should include a combination of two active principles with different mechanisms of action, in order to **prevent the emergence of resistance**. We have therefore initiated the discussions with other partners to evaluate drug candidates that can be combined to initiate the next clinical development phase for treatment and/or prevention.

Our strategic collaboration with the University of Cape Town in South Africa and the Medicines for Malaria Venture continues its drug discovery activities with the aim of identifying new therapeutic solutions for malaria and building research capacity in and for Africa. Together with our partners, we have identified promising drug candidates that are progressing into preclinical stage.

Preventing and controlling malaria transmission

Preventive methods, such as the use of insect repellents, form part of our strategic toolkit to combat malaria. We are testing our insect repellent IR3535®, which is already used for protection against the bites of insects and ticks that can transmit diseases such as Lyme, Zika, Dengue, and Chikungunya.

In a three-phase program defined in 2020 and implemented in Ghana, we are evaluating a **new formulation technology** for long-lasting efficacy of IR3535® – through laboratory tests and in a community-based study. Positive results would enable IR3535® to serve not only as a preventive method for personal use, but also, on a larger scale, as a vector control method to support population-based National Malaria Control programs.

In partnership with local institutions in Africa, we are improving health worker capacity in Ghana in using microscopy to detect cases of malaria and other diseases that can be diagnosed via blood samples even faster. In addition, we have established PAVON (Pan-African *Vivax* and *Ovale* Network), an African network of centers of excellence for the epidemiological surveillance and scientific research on malaria. We involved over ten African countries in the PAVON project in 2020.

open innovation sharing

We consider it our responsibility to improve global access to healthcare through our technological advances. We support a reliable and transparent legal framework for intellectual property that allows sustainable investment in research and development.

Our approach to sharing and protecting intellectual property

The responsible treatment of intellectual property does not pose a barrier to health, but rather guarantees **safety and high quality** for patients worldwide. Nearly all medicines that address the highest burden of disease in low- and middle-income countries are not protected by patents. Studies indicate that between 90% and 95% of the pharmaceutical products on the WHO Model List of Essential Medicines are off-patent.

We support a sustainable approach to intellectual property that drives innovation and enables access to health. We have made a commitment to refrain from enforcing patents in a majority of low- and middle-income countries. In markets where we do register product patents, we are transparent and committed to sharing data to the greatest possible extent and to improving public access to clinical study data. We report on the patent status of our products via the publicly accessible database Pat-INFORMED. Furthermore, we support voluntary licensing agreements of all kinds, including non-exclusive voluntary licenses, legally binding non-assertion covenants and clauses that aim to widen access to health.

Moreover, we support the concept of patent pools, and believe that these should be structured in such a way that they improve access to medicines, prevent anti-competitive behavior and overcome geographic limitations. We consider joining **patent pools** when they are relevant to our portfolio and meet all our efficacy, quality and safety requirements.

We provide access to patent information through our initiatives and partnerships. Through our open innovation research projects, we give access to parts of our chemical compound libraries. We aim to accelerate collaborative research programs that develop novel R&D platforms in search of new active substances.

How we organize access to our intellectual property

The Merck Open Innovation initiative is a collaborative and cross-functional effort. We aim to accelerate early discovery in diseases with high unmet needs and outside of our expertise through intellectual property sharing. We hope to foster the discovery of new generations of health solutions that will tackle the needs of the most vulnerable populations, with a primary focus on neglected tropical diseases (NTDs).

Our commitment: Supporting transparent and reliable frameworks

We support TRIPS, an international agreement administered by the World Trade Organization (WTO) that addresses trade-related aspects of intellectual property rights, along with TRIPS addenda such as the Special Declaration on the TRIPS Agreement and Public Health. This agreement extends the deadline for least developed countries to apply TRIPS provisions to pharmaceutical patents until 2033.

Initiative improves access to patent information

We are a founding member of the Patent Information Initiative for Medicines (Pat-INFORMED), which acts as a global gateway to medicine patent information. It offers tools and resources that help determine the existence of patents relevant to products sought by national and international drug procurement agencies, making it easier for them to access a basic body of patent information needed for implementing **disease management strategies** and other activities that address public health needs. Pat-INFORMED features patent information on small-molecule drugs for cardiovascular diseases, diabetes, hepatitis C, HIV, cancer, and respiratory disorders, as well as any products on the WHO Model List of Essential Medicines that are not within these therapeutic areas.

Open innovation collaboration through WIPO Re:Search

We continue to take part in the WIPO Re:Search Consortium co-led by Bio Ventures for Global Health and WIPO, whose mission is to accelerate the discovery and development of medicines, vaccines and diagnostics. In 2020, we renewed our commitment and contribution until 2022. The initiative aims to create **new solutions** for people affected by neglected tropical diseases, malaria and tuberculosis.

In 2020, we began implementing a collaboration agreement with Griffith Institute for Drug Discovery, Griffith University, Australia. For this collaboration, we have shared our chemical library for screening against leishmaniasis, Chagas disease and African sleeping sickness.

Creating research opportunities

In 2020, we launched the Open Global Health Library. It publicly shares 250 compounds from our proprietary chemical library that may be used for infectious diseases research, including antimicrobial resistance, with the not-for-profit R&D organization GARDP.

Additionally, our "Open Lab" initiative allows academic guest scientists to bring their own research and work side-by-side with our researchers in our laboratories, gaining access to our state-of-the art science and technology.

Drugs for Neglected Diseases initiative

Under the leadership of the Drugs for Neglected Diseases initiative (DNDi), along with other pharmaceutical companies, we are involved in the Drug Discovery Booster project to discover novel medicines against neglected tropical diseases.

More information on our collaborations regarding open innovation for global heath can be found on our website.

pharmaceutical supply chain

In many parts of the world, medicines are not always available where and when they are urgently needed. We want patients in low- and middle-income countries to have fast, safe and affordable access to our products. Efficient supply chain management and local manufacturing are crucial in order to achieve this goal.

Our approach to local supply chain solutions

During product development and manufacturing, we favor approaches that enable us to control the cost of goods and allow local manufacturing and supply chains that help to strengthen the local economy. We apply this model in our work with the Pediatric Praziquantel Consortium, for instance.

We partner with pharmaceutical companies and other supply chain stakeholders to strengthen supply chains in low- and middle-income countries and guarantee the targeted supply of medicines. We manufacture some of our products directly in the regions where they are needed in order to **build local capacity**, increase service quality and flexibility through reduced travel times and distances and to achieve cost savings that can be passed on to the consumer.

Our pharmaceutical supply chains are organized to ensure that our products reach the right place in the right condition and quantity, at an affordable price and on time. **Modern supply chain solutions** that include real-time monitoring enable us to track our inventories and current deliveries as well as predict expected demand for medicines.

How we organize our supply chains

Our Global Planning unit is responsible for our medicine supply chains and is part of Biopharma Supply Network Operations within our Healthcare business sector. Global Planning collaborates with supply chain representatives from the markets for efficient demand management. It also consults experts from other business sectors as needed.

Our commitment: High quality standards for pharmaceutical production

All our pharmaceutical production plants operate to the same high standard of quality worldwide. This ensures full compliance with Good Manufacturing Practice (GMP) and Good Distribution Practice (GDP) for us and our contract manufacturers.

Our Right First Time (RFT) concept aims to reduce the number of temperature excursions that occur during transportation worldwide. In addition to our RFT concept, we also encourage shipping sites and receiving units to work with freight forwarders and carriers to improve their processes.

Our **uniform quality assurance system** helps to ensure that our quality standards are universally respected. It comprises training courses, quality control monitoring and technologies tailored to each site. The results of all audits conducted by health authorities are published Group-wide, allowing the respective units to share lessons learned and benefit from the improvements made by others.

Through our virtual plant teams, we support our contract manufacturers in complying with quality standards. We assign a production expert to our external partners in Africa, Asia and Latin America to act as a virtual site leader and to provide guidance.

Ensuring supply during the Covid-19 pandemic

We ensured that all our manufacturing sites could continue operations during the Covid-19 pandemic. No business interruptions occurred at our facilities. They were able to carry on with medicine production thanks to sufficient stocks of active pharmaceutical ingredients. We were in constant dialogue with our distribution partners to make sure that we could deliver our goods despite severe transportation constraints.

Working with partners to achieve more

We store supplier information within a centralized platform, enabling us to exchange information Group-wide and use it for our collaborations and partnerships. This further supports our efforts to organize shared supply chains more efficiently.

Shared data platform for medicine donations

NTDeliver is a digital information tool for improving transparency in medicine donation supply chains created through public-private partnerships. Deliveries sent by companies that are running donation programs are clearly displayed – from purchase orders made by the World Health Organization (WHO) to delivery to the first warehouse in the destination country. The tool improves the coordination of our efforts and provides WHO, local experts and our company with a more **transparent overview** of the in-country inventories. The tool also features an alarm that informs key stakeholders about upcoming expiry dates of medicines that may still be in their inventory. We deploy the NTDeliver tool to monitor the volumes of schistosomiasis **medicines**.

Access delivery mentorship

Our partners and stakeholders require support when addressing the critical "last mile" challenge: ensuring that medicines are delivered to the patient. We help build the supply chain capacity of our partners through our access delivery **mentorship** initiative. It comprises a volunteer pool of supply chain experts who share their knowledge and experience. We also collaborate with Business for Health Solutions (BHS) to work with local distributors in Tanzania in order to address their supply and logistics challenges.

Two examples of this successful program can be seen in Tanzania: Bahari, a Tanzanian distributor, recorded a 96% order fulfillment rate (compared with an average of 82% before the project), a 75% faster purchasing time

and a **50% faster delivery time**. Mansoor Daya, a local Tanzanian manufacturer of essential medicines, recorded a 90% reduction in customs processing time, a 100% quality improvement of raw materials, and a 40% improvement in supplier quality and ceased business with predominantly high-risk suppliers due to increased documentation requirements.

Coalition for better medicine access

We are a member of **CAMP-N**, a coalition of government agencies, private-sector entities, non-governmental organizations, philanthropic foundations, and academic institutions. Together, we are dedicated to increasing access to medicines and health products for non-communicable diseases (NCDs) and reducing the impact of conditions such as diabetes, hypertension, and cardiovascular disease.

In 2020, we joined a technical working group to help develop a demand forecasting tool for medicines and health products used to treat non-communicable diseases in sub-Saharan Africa. We are the only private sector company representative in the cross-sectoral working group. As a next step, we will share the prototype NCD demand forecasting model with country stakeholders for feedback, and test it in Kenya and Uganda, followed by Tanzania.

Promoting local production

In India and Indonesia, we manufacture drugs for diabetes, cardiovascular diseases and thyroid disorders. These capacity-building efforts support local economies and allow us to supply medicines more rapidly and affordably to these and neighboring countries, such as Myanmar and Sri Lanka. We also **serve local markets** in China and Russia through local production, for example via contract manufacturing organizations (CMOs).

CURAFA™

In 2018, our company established the CURAFA™ initiative to develop a sustainable business model for primary healthcare services. In August 2020, the social enterprise Access Afya took over CURAFA™ and its associated facilities, thus supporting its goal to provide quality-assured, **low-cost microclinics** in underdeveloped areas.

Prices of Medicines

Part of the non-financial report

In OECD countries, pharmaceuticals accounted for between 6% and 35% of total healthcare spending in 2019. However, advances in the research and development of innovative medicines are significantly transforming the healthcare landscape, allowing chronic diseases – the greatest cost drivers – to be treated more effectively and affordably.

Our approach to pricing medicines

We want to help ensure that all patients have access to the most effective medicines for their needs, which is why we are working to prevent cost from becoming a barrier to treatment. We are committed to **flexible, fair and sustainable pricing** – both within and across countries. We therefore adapt our prices based on local market access, taking into account factors, such as health system capacity and financial standing, geographic circumstances and existing infrastructure, statutory requirements, unmet medical needs, and socioeconomic aspects, such as the patients' ability to pay. This approach involves working closely with governments and other stakeholders. In addition to these considerations, we continuously monitor dynamic healthcare environments and markets, pricing and reimbursement systems as well as legal and regulatory guidelines, adjusting our prices as necessary.

We review our prices on an annual basis to ensure they meet patient access needs. We use a consistent, **data-driven approach** to monitor our local pricing. In line with our fair pricing commitment, we also make our products affordable to patients in low- and middle-income countries by participating in government tenders, establishing high-quality affordable brands or branded generics, implementing early access programs and operating patient access programs.

Moreover, we support innovative risk-sharing agreements and are working to improve data efficiency in health systems, in order to achieve an optimal distribution of funds and resources.

Setting medicine prices

Our Global Pricing and Market Access unit evaluates market launch prices in coordination with the respective franchises. The team reports directly to a member of our Healthcare Executive Committee. Our local affiliates are responsible for managing prices and continually adapting them to local conditions.

Our commitment: Medicine price guidelines and principles

The affordability of our health solutions is part of our broader patient value proposition, which includes increasing accessibility, availability and awareness. Our medicine pricing adheres to the stipulations of our overarching Access to Health Charter and is defined in detail by our Pricing of Medicines guideline. Additionally, our Patient Access Programs Policy sets out standards for offering medicines at affordable prices.

Understanding the effects of Covid-19 on medicine pricing

The pandemic has put a major strain on health systems and treatment payers around the world. In December 2020, we organized a virtual expert roundtable with former payers from Brazil, Germany, Italy, Japan, Saudi Arabia, and the United Kingdom. The objective was to understand the impact of Covid-19 on payer priority, affordability, budget shifting, and resource allocation, in order to identify effective approaches to work in partnership with payers from different markets. Due to the budget constraints caused by the Covid-19 crisis, those payers perceived higher needs in pricing approaches including patient access programs, direct discounts, public-private partnerships and value add services. This is in line with our key pricing initiatives and will help us further reinforce these measures going forward.

Customer-centric contracting models

We are dedicated to advancing value-based healthcare through pricing and contracting mechanisms that fully comply with all applicable local laws and regulations. In collaboration with payers, such as health insurance companies, we developed various product- and market-specific reimbursement and contracting models. These help to provide patients with prompt **access to our innovations**. For instance, in the United Kingdom, Ireland and Germany, we continued with innovative risk-sharing agreements that provide immediate access to Mavenclad® for patients with multiple sclerosis (MS).

We have also established innovative contracting models for our oncology drug Erbitux®, our MS drug Rebif® and our growth hormone Saizen®, to make it easier for patients to obtain access to these medicines. Similarly, we have capped per-patient costs and formed risk-sharing agreements in certain countries.

Pricing schemes to serve low-income patients

We work in close partnership with governments and other stakeholders on innovative, differential medicine pricing schemes. In addition, we supply products at affordable prices to certain countries in Africa, Asia, Latin America, and the Middle East. In India, we continued to cooperate with public sector representatives, such as Bharat Heavy Electricals Limited (BHEL) and the Oil and Natural Gas Corporation (ONGC), National Thermal Power Corporation (NTPC) and Indian Railways (IR) to offer **discounted prices** for certain general medicine and endocrinology products to patients with a limited ability to pay out of pocket.

Moreover, we regularly participate in government tenders for products that are used in public hospitals serving low-income patients. Many of these tenders take place in low- to middle-income countries.

High-quality affordable second brands

For some of our existing brands, we have created high-quality second brands at affordable prices, particularly in countries with a large percentage of patients with very low incomes. In Brazil, 11 of our high-quality products are available at these affordable prices and in South Africa, we also offer Betacor™, a second brand for bisoprolol (Concor®), with a price reduction on all payer formularies to increase access for low-income patients. We have also established new affordable second brands in countries, such as Mexico, the Philippines and Poland.

Branded generics

We offer branded generics particularly in low- to middle-income countries. We do this together with selected reliable partners with whom we enjoy trusted collaborations. These partners generally have **track records in quality control** and are able to provide products that comply with our high standards. In this way we can better meet the urgent need for affordable, high-quality medicines required to treat endemic diseases. We already have six such products available to patients in low- to middle-income markets, including in Brazil, Chile, Mexico, and the Philippines, and we are currently registering further branded generics to expand this effort to more countries.

Patient access programs

We operate patient access programs that allow us to offer certain products at affordable prices in several countries. We run patient access programs in countries, such as India, where we offer a patient access program for Erbitux®, providing financial assistance to qualified patients of low financial means for their treatment – in line with applicable local laws and regulations. Every year, we reach over 500 patients through this program. In addition to our oncology initiatives, we also offer such programs for our medicines in other therapeutic areas, such as Rebif®.

Patient support programs

We provide digital health and "beyond-the-pill" solutions as part of our holistic approach to supporting patients, caregivers and physicians. This approach enables health professionals to **manage conditions more effectively**, thus helping to generate improved patient outcomes. We offer a customized medication and adherence program for cardiometabolic patients in Brazil and Russia, registering significant improvements in the rates of adherence to the treatment. We also support prediabetic patients with digitally enabled, tailored and evidence-based lifestyle intervention programs, such as GlycoLeap in the Asian-Pacific region and Virgin Pulse (previously Blue Mesa Health) in Latin America.

Health awareness

Many people have health conditions but do not realize it. This results in individuals either not receiving treatment or not receiving it in time, even though effective medicines and therapies are available. Therefore, we conduct global campaigns to raise awareness and improve knowledge of diseases in accordance with our expertise. Ultimately, healthcare professionals and patients can make informed decisions only if they have proper knowledge and the right information about symptoms and treatment options.

Our approach to raising health awareness

Awareness plays a key role in our approach to improving access to healthcare. We empower communities, medical professionals and patients with appropriate tools, information and skills so that they can make **informed decisions** about prevention, diagnosis, treatment, care, and disease management.

For example, we join forces with committed partners to conduct educational campaigns for prevention, early diagnosis and awareness. This also helps build the capacities of medical professionals working in the fields of research, technology and healthcare.

How we build health awareness

The strategic direction and output of all awareness activities are aligned with our respective business units. Our various business units plan and implement our awareness projects either on a global level or through our offices, with projects organized according to the **specific needs of the local community**. The offices are also responsible for local mobilization during our global campaigns.

Our commitment: access to health through awareness

Our strategy for addressing access to healthcare incorporates the topic of awareness and is laid out in our Access to Health Charter. Our awareness campaigns are also subject to the respective marketing principles set out in guidelines, such as our Pharma Code for Conducting Pharmaceutical Business and Pharmaceutical Operations. In addition, our campaigns are governed by internal policies and guidance for reviewing our interactions with health systems and by the review processes for communication materials as well as further global, regional and local rules and regulations.

Global awareness campaigns

We regularly conduct campaigns to raise awareness of various diseases across the globe, often in collaboration with patient advocacy groups. We focus on diseases that are aligned with **our core competencies**, expertise and experience along the health value chain. These include cancer (specifically colorectal as well as head and neck cancer), thyroid disorders, diabetes and multiple sclerosis in particular. We also conduct awareness campaigns in low- and middle-income countries, mainly focusing on the neglected tropical disease schistosomiasis as well as other, more familiar infectious diseases, such as malaria.

Awareness and knowledge transfer for thyroid disorders

In May, we supported International Thyroid Awareness Week (ITAW) for the 12th consecutive year. The annual awareness campaign, which we founded together with the Thyroid Federation International (TFI), aims to highlight some of the **lesser-known aspects** of thyroid disorders.

This year's ITAW was dedicated to the theme "mother and baby", with a focus on mothers learning how to protect themselves and their babies from any potential complications related to thyroid disorders. The campaign reached people in many countries via virtual events and press articles. On social media, we generated over 5.7 million views and 34,000 likes. In addition, our symptoms checker received almost 300,000 views and over 166,000 tests were carried out.

World Cancer Day

February 4 marks World Cancer Day, an annual initiative led by the Union for International Cancer Control (UICC). Building on the theme "I Am and I Will", we created a compelling campaign to communicate our ongoing commitment to transform cancer care. Our campaign focused on how personal contributions make a collective impact on the evolution of oncology care. It was supported by more than 240 images from 20 countries, receiving over 400,000 views on social media.

World Multiple Sclerosis Day

We participated in World Multiple Sclerosis Day on May 30 – an annual awareness day by the MS International Federation (MSIF). This year's official theme was #MSConnections and it focused on building community connection, self-connection and connections to quality care while **challenging the social barriers** that leave people affected by MS feeling lonely and socially isolated.

For World MS Day, we collaborated with Twitch, the world's leading service and community platform for multiplayer entertainment. Through an eight-hour livestream with Twitch influencers and special guests, we virtually connected people affected by the disease and raised awareness among young gamers. The livestream was also used to raise money for MSIF's "Informed Decision Making" program, which helps create digital resources so that people with MS have access to the best possible information on the disease for free.

World Diabetes Day

The theme of this year's World Diabetes Day was "The Nurse and Diabetes": As the name suggests, the goal was to highlight the incredible work carried out by nurses. We also extended our awareness-raising activities to prediabetes, the lesser-known precursor to type 2 diabetes. We partnered with social media influencers to launch our social campaign **#AreYouReadingTheSigns**. The aim of this campaign was to highlight the importance of individual responsibility when it comes to health as well as the significance of lifestyle changes in diabetes and prediabetes management. We launched our prediabetes initiative one day before World Diabetes Day in order to raise awareness of prediabetes and inform the public of the risk factors for developing the condition. Ultimately, we wanted to encourage people to use our prediabetes symptom checker to understand their level of risk and take appropriate action if necessary.

Fertility awareness week

European Fertility Week (EFW) in November 2020 provided an opportunity for our company to increase awareness of in vitro fertilization and the patient journey. Using our social media channels, we drew attention to the importance of providing equal access to infertility treatment across Europe and relying on medical guidance to provide safe, efficient and non-discriminatory treatment to all who need it.

Awareness campaigns focusing on low- and middle-income countries

We use global health-related campaigns to foster awareness of diseases, such as schistosomiasis and malaria as well as non-communicable diseases with high prevalence in low- and middle-income countries. The campaigns are part of our commitment to improve health in those countries.

Global health-related awareness campaigns in 2020 included:

- World NTD (Neglected Tropical Diseases) Day (January 30)
- World Water Day (March 22)
- World Health Day (April 7)
- World Malaria Day (April 25)
- World Mosquito Day (August 20)
- World Water Week (August 23-28)
- World Science Day (November 10)
- Universal Health Coverage Day (December 12).

Purpose-driven initiatives

Healthy Women, Healthy Economies and Embracing Carers™ are two initiatives that we are using to promote awareness of issues that go beyond the patient. The interconnectedness of both initiatives is rooted in shared themes and goals. In particular, the Covid-19 pandemic demonstrates the **critical importance of caregiving** as a part of the healthcare ecosystem and the significant role that women play as caregivers: 70% of caregiving hours globally are provided by women and girls. Effective caregiving is intrinsically linked to the health, well-being and prosperity of women. Through these initiatives, we aim to both promote women's empowerment and expand access to healthcare.

Healthy Women, Healthy Economies

To empower women to overcome the challenges of communicable and non-communicable diseases and rise to their economic potential, we are committed to the Healthy Women, Healthy Economies initiative. Within the scope of the Asia-Pacific Economic Cooperation (APEC), we collaborate with representatives of several governments through this public-private partnership, which seeks to identify and implement policies that advance women's health and well-being, thereby supporting their participation in the economy.

In 2020, we continued our partnership with the "March of Dimes" initiative in a three-year collaboration supporting "Healthy Babies, Healthy Business", a program that provides health benefits for mothers and promotes family-friendly work environments. As part of this partnership, we support the Center for Social Science Research. In 2020, we helped fund two U.S.-focused studies on issues such as access to healthcare and birth inequities.

Through our partnership with the Wilson Center, we highlighted the disproportionate **economic impact of Covid-19** on women. This included a podcast on the pandemic, caregiving and women's leadership, featuring Belén Garijo, Vice Chair of the Executive Board and Deputy CEO of Merck, and a webinar with expert panelists.

Embracing Carers

Embracing Carers™ is a global initiative that we lead in collaboration with prominent caregiving organizations around the world. Embracing Carers™ is designed to increase awareness, action and discussion around the frequently overlooked needs of caregivers. We believe that the topic of caregiving is one of the most under-addressed public health issues of our time, with caregivers receiving little recognition and support despite providing vital services for others. We raise awareness of the challenges faced by caregivers, prompt stakeholders to show deeper engagement, establish **global best practices** and advocacy resources, and endorse the improved integration of carer support.

In 2020, we launched a survey involving 12 countries to explore the unmet physical, economic and emotional challenges carers face amid the Covid-19 crisis. We want to determine how these challenges differ by gender, socio-economic status, length of time as a carer, the types of conditions under which carers are working, and the level of care needed. We aim to use the results from this survey, in conjunction with other secondary research, to increase media attention, raise awareness of these issues and inform calls to action for policy advancements.

product safety and quality

chemical product safety

Part of the non-financial report

Many of our chemical products have intrinsic hazardous properties. We are working to minimize the risk to human health and the environment resulting from their use. National and international regulatory requirements such as laws and guidelines form the basis of our data and documents. Beyond this, we strive to improve our product safety and reduce the environmental impact of our business through innovative solutions and digital communication tools.

Our approach to safe chemical products

Product safety is one of our top priorities. Starting at the product launch stage, we investigate the potential adverse impacts chemical substances may have.

Along the entire value chain of our products – **from raw materials to manufacture and commercialization** – we provide relevant information on the hazardous properties and related use instructions to allow the safe handling and use of our products, in line with regulatory requirements. We communicate this information mostly through relevant digital channels (Internet, e-mail, mobile apps). Paper safety data sheets are still common in some countries and can also be provided on demand through customer service.

We support developments related to the European Green Deal and are preparing to translate the pertinent elements into a dedicated chemicals sustainability strategy for our company.

How we ensure chemical product safety

Our Healthcare, Life Science and Performance Materials business sectors have organizational structures in place to implement our product safety strategy for their businesses and customers. This includes registering chemicals, classifying hazardous substances and highlighting risks by means of safety data sheets, labels and digital communications.

Our Corporate Governance function issues **Group policies and standards** as a framework to govern the setup of effective operational processes for product safety, hazard communication and chemicals regulations compliance throughout our various business sectors. Our Group Product Safety Committee monitors relevant regulatory developments.

This approach also applies to innovative fields of development such as nanomaterials, which we utilize with the greatest care in line with the precautionary principle. Furthermore, our Group-wide Policy for Use and Handling of Nanomaterials provides the necessary guidance on the utilization of this technology.

Legal requirements and internal guidelines

Through internal guidelines, we define the roles and responsibilities and basic processes required to **comply with national and international regulations**. We have endorsed general voluntary commitments of the chemical industry, such as the Responsible Care® Global Charter.

The legal requirements relevant to compliance with chemicals regulations are mainly related to hazard communication as well as local and regional chemical registration activities. These requirements are expanding globally, with a growing number of countries adapting local rules to existing regulatory frameworks such as REACH. We are well-placed to comply with emerging regulations of this kind in important markets such as China, India, Japan, South Korea, and Taiwan. Using the Globally Harmonized System (GHS) for hazard communication allows us to streamline our internal processes and provide consistent, harmonized and high-quality information to our customers.

Our **worldwide network of regulatory experts** in all three business sectors continuously monitors changes in legal requirements and scientific developments to stay ahead of trends and best practices.

In 2020, there were two minor incidents of non-compliance with regulations, specifically concerning potential health and safety impacts and the labeling of our chemical products. Neither human health nor the environment were negatively impacted.

REACH registration

In July 2020, our company signed the Cefic REACH Dossier Improvement Action Plan to review and improve the quality of our registration dossiers. This way, we also keep the information up-to-date and adapt to increasing regulatory requirements.

Safety analysis during product launch

We believe that product safety starts with development. At an early stage in the product launch process, we analyze innovations in terms of their impact on human health and the environment. In doing so, we can quickly identify any undesirable properties. In line with the applicable rules, we

evaluate the intrinsic hazards of our existing as well as new products to create the relevant product safety information.

Product safety information

Chemical product safety is all about protecting human health and the environment from negative impacts resulting from the use of chemical products throughout a product's life cycle. To achieve this, we **provide all relevant information to our customers and the public**, raising awareness of the hazards and building understanding of how to mitigate risks and use the products safely.

To obtain all the relevant information on hazard profiles, we utilize **industry standard digital tools** that gather all information available for the substances we use. We then cross-reference this data with local and regional rules to establish the relevant hazard classifications. We publish this information digitally on **country-specific safety data sheets** in multiple languages and on the labels of our products. The data sheets are maintained electronically and updated if there are relevant changes, or during a 3-5 year review cycle. We have automated and standardized the majority of our hazard communication processes.

For products with little information available, we are investigating the feasibility of using alternative predictive, **non-animal testing methods** such as read-across and (Q)SAR. For third-party products, we expect robust product safety documentation from our suppliers, which we feed into our processes or share directly with our customers.

Helping customers access safety information

To share information with our product users, we employ the latest digital tools and continuously explore new technologies.

Our Life Science customers can access product safety information in their respective language and according to country-specific regulations through a dedicated **mobile app called "My M Safety"** (Android and iOS). The information is retrieved by scanning a bar code on the product label or entering a material number.

Through our ScIDeEx™ web tool, anyone can check whether using a particular chemical is safe within the boundaries of EU REACH exposure scenarios. ScIDeEx™ is based on a full implementation of the ECETOC TRA 3 model for human exposure assessments in industrial and professional settings.

patient safety

Part of the non-financial report

The safety of patients treated with our medicines is our absolute priority. Our pharmaceutical products need to be effective in treating the respective disease, while posing as little risk as possible to patients. That is why we consistently monitor risks and adverse effects that may arise and take the necessary actions to minimize them.

Our approach to ensuring patient safety

Through a rigorous benefit-risk management process, we help to ensure that the benefits of our drugs always outweigh the risks for patients. Every new medicine goes through a series of precisely defined development stages. Before any drug is administered to human subjects, we conduct extensive preclinical testing both in vitro and in vivo. Through toxicological testing, we determine whether an active pharmaceutical ingredient is toxic to living organisms and, if so, at what dosage. This also helps us determine the dose that humans can safely tolerate. Only when this is complete do we perform clinical studies to investigate the safety and efficacy of the drug when used in humans. During clinical development, we diligently use all collected data to continuously evaluate the drug's **benefit-risk profile**. If we consider the drug's benefit-risk profile to be positive, we then submit an application for marketing authorization to the relevant regulatory authorities.

Continual monitoring

Once a drug is launched, the number of patients being treated with it increases significantly. In certain circumstances, rare adverse and potentially serious effects that were not detected during clinical development may occur, which is why we continuously monitor and manage the benefit-risk profiles after market launch. Pharmacovigilance includes the process of monitoring a drug on an ongoing basis to detect and assess signals as part of signal management activities. The aim is to track adverse effects in an effort to take appropriate action to minimize and communicate the risks in a transparent way. We always provide healthcare professionals and patients with the **latest information on the safety** of all our marketed drugs. The above applies to the entire life cycle of a product, ranging from development, market launch and commercialization to expiration of the marketing authorization.

Capabilities that we have developed and strengthened in this area include:

- Advanced benefit-risk management
- Big Data analytics (using real-world data)
- Advanced signal detection technology
- Pilot processes in patient-centric adverse effects collection

Based on the conditions of regulatory approval, we develop and update **educational materials for patients and healthcare providers** to communicate any known and potential risks and ways to minimize them for newly approved products. We assess the effectiveness of these materials in close collaboration with our Benefit-Risk Action team. If required, we adjust the contents of the materials and their distribution and describe the results from the effectiveness analysis in our periodic safety reports and risk management plans. We then submit these to the relevant health authorities for evaluation.

How we monitor patient safety

Our Global Patient Safety unit is responsible for pharmacovigilance. It continually collects **current safety data** from a wide variety of sources across the globe, including clinical studies, early access programs, spontaneous reports on adverse effects, patient support programs and articles published in medical and scientific journals.

Our experts help to make sure all information on the risks and adverse effects of our medicines is properly documented, tracked and reported to the respective health authorities in accordance with regulatory requirements. Our Global Patient Safety unit analyzes all data and reassesses the benefit-risk profile based on these data, where required. We then inform regulatory authorities, healthcare professionals and patients about new risks, additional risk mitigation measures and potential changes **in the benefit-risk profile**.

In order to implement our R&D Strategy 2023, our Global Patient Safety unit in on a journey of transformation. Our vision is to integrate deep knowledge of safety into early decision-making as we evolve to practice predictive safety. As part of our transformation, in 2020 we refined our approach to benefit-risk assessments. We now apply a scoring system based on safety aspects and are using it to prioritize product management; in addition, we are redesigning our pharmacovigilance processes.

Our **Healthcare Quality** unit processes quality complaints relating to our products. When quality defects may have an impact on patient safety or lead to adverse effects, Global Patient Safety gets involved.

Our Medical Safety and Ethics Board

Our Medical Safety and Ethics Board (MSEB) oversees the safety and benefit-risk assessments of our drugs throughout clinical development and commercialization. It endorses appropriate **measures to minimize risk**, such as package leaflet updates. This board is chaired by our Chief Medical Officer and consists of experienced physicians, scientists and experts from our company. Throughout a drug's entire life cycle, the MSEB reviews and assesses important medical safety risks and benefit-risk issues, and reviews human-related ethical issues, as appropriate.

Within the Global Patient Safety unit, the Benefit Risk Action team is responsible for signal management, benefit-risk assessment, risk management and all topics regarding product safety and the benefit-risk profile of our medicinal products. Recommendations from the Benefit Risk Action team are endorsed by the Pharmacovigilance Advisory Board, also chaired by Global Patient Safety unit. Important issues may be submitted to the MSEB for final assessment.

Effects of the divestment of Allergopharma on patient safety

On March 31, 2020, we completed the divestment of our allergy business Allergopharma to Dermapharm Holding SE. We entered into a transitional service agreement with Allergopharma/Dermapharm that defines certain services from us for an interim period after the closing date. One of these transitional services was a Pharmacovigilance Statement of Work (PV SOW), defining the transitional pharmacovigilance services provided by Merck until all affected pharmacovigilance activities had been migrated to Allergopharma/Dermapharm on November 30, 2020. This step was achieved one month prior to the scheduled date.

Our commitment: Guidelines and statutory requirements

We follow international guidance and standard procedures, such as the International Conference for Harmonization (ICH) guidelines and the Good Pharmacovigilance Practices (GVP) established by the European Medicines Agency (EMA) and national health authorities. In addition, we adhere to all statutory pharmacovigilance regulations in those countries where we market our products.

In 2020, our Global Patient Safety unit formed a Pharmacovigilance Intelligence Council that focuses on changes in pharmacovigilance legislation and their impacts on our global and local pharmacovigilance systems. This enables us to make strategic decisions and to govern changes in pharmacovigilance requirements.

Collecting information and checking processes

In response to new requirements to the new data transmission format stipulated by ICH guideline E2B(R3), we upgraded our **Global Safety Database** to ensure the technical capabilities needed to support the coordinated exchange of individual case safety reports (ICSR). In 2019, we started safety reporting in line with the enhanced E2B(R3) standard in China, Europe and Japan, and further rolled out the reporting to Russia and Taiwan in 2020.

We are following up on changes to the European GVP guidelines and preparing for the introduction of the new clinical trial regulation. In addition, we are implementing the new pharmacovigilance requirements in the United Kingdom associated with Brexit and introducing changes according to the timeline proposed by the Medicines and Healthcare products Regulatory Agency (MHRA).

In 2020, we assessed new **country-specific regulatory requirements** and implemented necessary changes in order to meet them.

Monitoring drug safety

Regulatory authorities conduct periodic inspections to verify that we comply both with statutory requirements and with our own internal standards for drug safety. In Germany, these are handled on behalf of the European Medicines Agency (EMA) by the German Federal Institute for Drugs and Medical Devices (BfArM) and the Paul Ehrlich Institute (PEI), the German Federal Institute for Vaccines and Biomedicines. We follow up on the findings of health authority inspections and take the necessary actions to ensure the proper functioning of our pharmacovigilance system. In 2020 we did not receive any requests for **pharmacovigilance inspections**.

Furthermore, we **perform audits** to ensure that all our units and subsidiaries involved in pharmacovigilance consistently meet all requirements across the globe. In 2020, we conducted a total of 19 pharmacovigilance audits and found no significant deviations in our pharmacovigilance system from these requirements. We also audit vendors and licensing partners involved in pharmacovigilance, which helps us improve our pharmacovigilance processes so that they surpass statutory requirements. In light of the Covid-19 situation, we adjusted our audit plan and methods. Several audits were postponed and others were conducted remotely.

Responding to the Covid-19 pandemic

In light of the Covid-19 outbreak in 2020, various health authorities across the world issued guidance clarifying the expectations for manufacturers, importers and marketing authorization holders on the implementation of clinical trials, reporting of adverse events from clinical trials and post-marketing sources, and the management of other safety aspects during a pandemic.

Based on this we changed several of our standard reporting procedures. For example, adverse event reports associated with Covid-19 were identified as a priority and submitted as required to the respective national health authorities.

Furthermore, some national health authorities adapted their requirements regarding the electronic submission of adverse events and additional **risk minimization** information, and we did so accordingly. Industry representatives and health authorities discussed the need for more regulatory flexibility to account for the potential increased reporting of adverse events related to widespread use of medical products to help treat or prevent Covid-19.

Our Global Patient Safety unit's Business Continuity Team (BCP) routinely monitored the impact of Covid-19 on pharmacovigilance operations. No disturbances to our own operations at a local or global level were detected, and the impacts on business partners were minimal.

As in many other areas of our business, we made use of a remote working model due to physical distancing requirements. We introduced electronic signature processes for safety data exchange agreements with business partners as well as for internal documents to safeguard business continuity.

Redefining our approach to benefit-risk assessments

We have developed a benefit-risk blueprint strategy in order to help us transform from a reactive and compliance-driven organization into a proactive and benefit-risk-focused organization. By truly understanding the benefit-risk profiles of our products, we can enable early decision-making within the organization. Ultimately, the aim is to be able to provide **the right medicine to the right patient at the right time**.

As part of this initiative, we have also developed the concepts and principles for conducting benefit-risk assessments at each stage of product development and post-marketing.

We have completed the design phase of this benefit-risk blueprint strategy, created guidance and developed a change management plan. We are now in the implementation phase and are conducting several pilots to better understand the model's impacts and adjust it accordingly.

Assessing the safety of our products

We employ a product prioritization tool as a means to score the safety of our products in an objective, proven way, based on several critical safety and relevant cross-functional parameters. The output scores provide a categorization of products into high, medium or low priority. These categories have a major impact on the subsequent methodology used for all safety activities, allowing us to define working models for safety surveillance and benefit-risk assessment activities for low- and medium-priority products, allowing us to focus on high-priority assets. The tool is helping us to further develop an integrated, proactive safety approach. Additionally, it provides us with a reference to ensure regulatory compliance.

We are in the process of redesigning all pharmacovigilance processes (ICSR management, signal management, benefit-risk blueprint strategy and aggregate safety reporting) to account for product priority category in the component process steps.

In particular, we are successfully incorporating the product prioritization tool into the development of our risk-based operating model within the Global Patient Safety unit. We published the initial version of the product prioritization tool in January 2020. A planned annual update ensures that the tool accurately reflects the current safety status of all products.

Innovative safety signal detection

Through our tool for safety signal detection, called Empirica, we analyze and manage large amounts of global data, such as scientific studies and news about adverse effects. This helps us to comply with regulatory timelines for safety signals and other safety-related factors and helps to ensure that all signal data, documentation and decisions are captured in one place. It also allows easy access to and analysis of our data, as well as cross-functional collaboration between the Global Patient Safety unit and other internal and external stakeholders. The implementation of Empirica has **improved the tracking and oversight of all safety signals**. Using diverse statistical tools and leveraging all available safety data from our internal and external databases makes it possible to identify new signals and their assessment of risk for the patients.

Up-to-date labeling and product information

Our product information explains to health care professionals and patients how to properly use the respective drug and allows for an informed decision on treatment. In accordance with statutory regulations, the **package leaflet** contains all relevant information such as indication(s) and ingredients, as well as dosage, storage, mode of action, instructions for use, warnings, precautions and possible adverse effects. Should the medicine contain ingredients that could impact the environment, the package leaflet may also contain information on the proper disposal of the product.

We review and update all product information documents such as package leaflets, ensuring that our medicinal products contain the latest information on safety, efficacy and pharmaceutical formulation as appropriate. In accordance with statutory requirements, all modifications to the leaflets are submitted to the respective regulatory authorities for approval. In 2020, there were no incidents of non-compliance with statutory regulations concerning labeling of drugs or pharmaceutical products.

Internal and external training

All employees involved in the safety and quality of pharmaceutical products take part in training in line with our global training standards. We verify compliance with these requirements by producing training compliance reports and by performing regular audits.

Our training is delivered via a global learning platform. All of the approximately 24,000 of our Healthcare employees receive **basic pharmacovigilance training** once a year that covers the procedure for reporting adverse effects from our products. Other training courses keep employees up to date on their professional expertise as well as internal standard operating procedures and other relevant requirements. This helps to ensure adherence to Good Pharmacovigilance Practice (GVP) requirements.

Enhancing patient safety and sharing expertise with other countries

Reporting side effects with the agReporter app

In line with our goal to enhance patient safety, we have created and published a patient-friendly app called agReporter. In 2020, we continued with the rollout in several markets and developed it further. With this app, not only field nurses and our sales representatives, but also non-medically trained users can **report any suspected side effects** or adverse events arising from the use of our products. This places patient feedback at the core of our efforts to consistently collect data on adverse effects.

In 2020 we initiated the collaboration with local professional associations in Kenya, Nigeria and potentially other countries to deliver training to healthcare professionals on identifying adverse events and how to report them. We will roll out the agReporter app in these countries with instructions on how to report suspected adverse events associated with our medicinal products. The app is available in a total of 14 languages and additional language versions are in preparation.

Pharmacovigilance in Access to Health

We endeavor to transfer our drug safety expertise around the world, especially to countries where healthcare workers need to build their pharmacovigilance expertise.

We want to increase the contribution of pharmacovigilance in our Access to Health strategy (A2H). Fostering pharmacovigilance initiatives in safety data-sharing with health authorities and building pharmacovigilance capacity with reputable partners in underserved countries in a sustainable way are key aspects of this strategy. This is why we selected low- and middle-income countries from the UN Human Development Index (HDI) and included these in our project scope. For the selected countries we employ ambassadors in each region to systematically collect and report information on pharmacovigilance initiatives and activities, as further detailed below:

The Medical Dictionary for Regulatory Activities (MedDRA) is a clinically validated medical terminology system used by health authorities and the industry worldwide. Following the release of the new MedDRA version 22.0, the MedDRA Maintenance and Support Services Organization (MSSO) presented the Russian version of MedDRA and we contributed to the review of the Russian translation. We also collaborated with health authorities in Brazil to support the creation of a local language version, which was released in March 2020.

Through the A2H initiative, we also promote patient centricity in low- and middle-income countries through **pharmacovigilance awareness** communication measures that we develop and distribute. In 2020, we conducted an adverse event campaign in Kenya and Nigeria. The campaign was aimed at sensitizing the public to unexpected symptoms that individuals may experience after taking a medicine and the actions they can take – such as seeking medical advice and reporting the incident to the relevant health authority or market authorization holder. We also plan to roll out a non-promotional video and audio messages through local media agencies, explaining how to identify adverse events as well as recommended steps in both English and Swahili.

The Kenyan health authority, the Pharmacy and Poisons Board, has approved the project for the awareness-raising campaign, the training of healthcare professionals and the use of our agReporter app. The project is scheduled for rollout in the first quarter of 2021. The lessons learned from this campaign will be incorporated within a similar campaign and initiative that is being planned in Nigeria.

Off-label use

We endeavor to **drive scientific and medical progress**, often doing so in close collaboration with medical professionals.

We receive inquiries about the therapeutic use of our products beyond the marketing authorization (also referred to as off-label use). For example, while each medicine is authorized for use in specific indications, a physician may wish to administer a product to a patient suffering from a disease for which it is not approved.

We market our medicines only within the scope of their specific marketing approval. Any medical-scientific information about the use of our products beyond the existing marketing authorization is provided by qualified medical personnel only in the case of unsolicited inquiries. The information shared must be backed by scientific evidence and factually balanced clearly stating that it applies to unapproved use. Also, Merck employees are not permitted to give any sort of treatment recommendation on individual patient care or treatment.

Our principles for providing information about the unapproved use of our products have recently been updated in a standard document which became effective in 2020.

product-related crime

Part of the non-financial report

According to the World Health Organization (WHO), a considerable proportion of the medicines in low- and middle-income countries are illegal, counterfeit or substandard. In industrialized nations, however, such products are also becoming increasingly available on the market through unlicensed Internet pharmacies and dubious online platforms, posing a risk to public health. Moreover, chemical products can also be used for criminal purposes, such as the manufacture of illicit drugs.

Our approach to product-related crime

Our company develops and manufactures products of the highest quality. In order to protect customers and patients, we secure our products against counterfeiting. We are also resolute in our fight against product-related crime by, for instance, collaborating closely with health, regulatory and law enforcement agencies at the **regional, national and international level**. In taking preventive action, we cooperate with representatives, Interpol and the World Customs Organization. Our guidelines, standards and processes apply to all our business sectors and markets worldwide.

How we define product-related crime

1. **Counterfeit products:** In line with the relevant WHO standard, we define a counterfeit product as "a product that is deliberately and fraudulently produced and/or mislabeled with respect to its identity and/or source to make it appear to be a genuine product."
2. **Illegal diversion of products:** This term refers to the diversion of either pharmaceuticals or chemical substances from within the legitimate supply chain either to sell or export them through illegal channels to produce narcotics, weapons or explosives, or to use them for other illegitimate purposes.
3. **Misappropriation of products:** This refers to theft from production sites, warehouses or while in transit.

How we are tackling product-related crime

Our Group Corporate Security function coordinates all our activities for fighting product-related crime. All measures are overseen by the Chief Security Officer and head of "Environment, Health, Safety, Security, Quality" (EQ). Furthermore, all our sites have a product crime officer, who is responsible for responding to potential cases of counterfeiting, acting as the interface between local regulatory and law enforcement authorities, national associations, our Group functions, and our sites.

Group-wide anti-counterfeiting network

Our Anti-Counterfeiting Operational Network (MACON) is responsible for **globally monitoring and executing all anti-counterfeiting measures** for our products. As well as coordinating preventative measures and the development of security systems, this organization also oversees investigations. Comprising experts from various units such as Legal/Trademarks, Product Security, Export Control, Supply Chain, Patient Safety, and Quality Assurance, this network is coordinated by our Corporate Security unit.

To investigate suspected cases, MACON collaborates with the competent law enforcement agencies and regulatory authorities. In 2020, the Merck Anti-Counterfeiting Operational Network (MACON) investigated and pursued numerous incidents that primarily involved **counterfeits within the legitimate and illegitimate supply chains** as well as theft and illegal diversion.

Our commitment: Group-wide guidelines and standards

Our guideline entitled "Illicit Trade & Product Crime Prevention" describes our goals and strategies for combating product-related crime. The Group-wide Product Crime Incident Management standard sets out **mandatory requirements** and defines the procedures we follow within the Group, thereby ensuring cases are managed efficiently. Moreover, it creates a clear framework for dealing with illicit products.

Enhanced monitoring and reporting systems

We analyze and document all counterfeit product incidents using a Group-wide reporting system. This approach provides us with a **comprehensive picture of the security situation**, enabling us to identify possible links between different cases and effectively tackle them. Our standard operating procedure entitled "Data and Documentation Quality Management" describes the corresponding process, making the risks more transparent and the processes more efficient.

Tracking system for chemical substances

We monitor chemical substances that could be misused to produce illegal weapons, explosives or narcotics, tracking them through an **internal system** that flags suspicious orders or orders of sensitive products. These are released only once we have confirmed the existence of a verified end-user declaration.

In addition to fulfilling the duties stipulated by **statutory provisions on export control**, we also report suspicious orders, inquiries and requests to the competent authorities. Through these efforts, we are honoring a voluntary commitment of the German Chemical Industry Association (VCI) and meeting the terms of the Guideline for Operators published by the European Commission. In 2020, we reported 1,148 orders placed for relevant substances. In addition, we received 15 inquiries from authorities regarding

specific suspected cases that we helped to resolve. We evaluate the effectiveness of our measures for avoiding product misuse based on, among other things, the number of incidents suggested to us by the authorities and solved.

Supporting customers and patients

To protect patients, the identity and authenticity of pharmaceuticals must be verifiable. We ensure this by rigorously implementing the requirements of the EU Falsified Medicines Directive. We apply a **unique serial number** to the packaging of all the prescription medicines we commercialize in the European Union (Track and Trace). We also comply with similar government-stipulated systems in other countries around the world.

In addition, we also pursue our own initiatives:

- We apply the Security M label to some of our products, enabling users to **easily verify authenticity**. We take a risk-based approach to identifying the products to be labeled in this manner.
- In the **Mobile Anti-Counterfeiting System (MAS) project** in Nigeria, we are working closely with one of our suppliers on a text message-based identification system. Patients scratch off a barcode that is printed on the product packaging then text this code to a number that has been specifically set up for this purpose. They immediately receive a response telling them whether their code is authentic.
- According to a WHO report, more than 10% of all medicines in low- or middle-income countries and emerging countries are counterfeit or substandard. That is why we sponsor the non-profit Global Pharma Health Fund (GPHF), which supplies the **GPHF-Minilab®**, a compact laboratory used mainly in countries with inadequate access to health solutions to test the quality of up to 100 different active ingredients quickly and inexpensively. The test methods are described in a manual, which has also been available in French and Spanish since 2020. More than 890 Minilabs are currently in use. In 2020, 29 Minilabs were delivered: 21 went to Africa, particularly to countries in the Economic Community of West African States (ECOWAS), and seven went to Asia (Afghanistan and Bangladesh). One remained in Germany for future training sessions as part of the "Global Health Protection Program" run by the Germany Federal Ministry of Health.
- Since 2018, we have been collaborating with Boston University. Together, we are testing, investigating and optimizing a new **user-friendly instrument (PharmaChk)**, which identifies and quantifies active ingredients and helps us to detect counterfeit and substandard medicines. We are planning to use the portable instrument primarily for antimicrobial and anti-malarial compounds in low- and middle-income countries.
- We offer our customers in the pharmaceutical industry **Candurin® pearl effect pigments** with unique color properties. When used to coat of tablets and capsules, these pigments make it more difficult to create counterfeit copies.

Raising awareness of product-related crime

We aim to continuously raise awareness of product-related crime among our business partners and employees, educating and training our employees Group-wide on the subject. All staff involved in security, such as product crime officers, participate in appropriate **training programs** aimed at building their capacities and promoting best-practice sharing. We are continuously evolving these programs and adapting them to new trends.

Security audits for contract manufacturers and distributors

We regularly check whether our distributors and contract manufacturers are complying with GMP- and GDP-Standards (Good Manufacturing Practice/Good Distribution Practice). These audits are based on the "EMA ICH Q10" pharmaceutical quality assurance standard and allow us to ascertain the extent to which our **security requirements** are being met by contract manufacturers and distributors. In addition, we conduct special security audits if a concrete need is identified. This applies to both pharmaceutical contract manufacturers and companies that print packaging. Defects that we deem as critical must be rectified either before we enter into a contract, or a detailed corrective action plan must be submitted for our approval. In 2020, we conducted this type of security audit in China, which found four critical, two significant and three minor defects. No contract was entered into.

Transport and warehouse safety

Part of the non-financial report

Around the world, we transport and store numerous products and materials. These include commercial chemicals and pharmaceuticals, raw materials, intermediates, and waste as well as technical materials and packaging, all of which could pose a hazard to health and the environment if handled incorrectly.

Our approach to safe transport and storage

All our shipments are to reach our customers and sites safely, undamaged and with the required safety information. Several of the materials we store and transport are classified as hazardous. The storage of such dangerous goods and the transport thereof – whether by road, rail, plane, or ship – are governed by regulations applicable worldwide. To minimize risks to people and the environment, we apply **strict safety requirements across the Group** that of course also comply with all applicable laws. We conduct regular reviews to ensure that our own warehouses as well as those of third parties comply with these regulations. In addition, we train our employees on warehouse and transport safety requirements.

How we achieve transport and warehouse safety

Overriding responsibility for transport and warehouse safety lies with our Group Environment, Health, Safety, Security, Quality (EQ) function (see Environmental stewardship), which defines the standards and guidelines applicable Group-wide. In addition, our individual sites are subject to national and international regulations governing environmental stewardship and public safety. At the local level, the **respective site directors** are responsible for ensuring compliance with all safety requirements.

Each of our sites around the world with logistics activities has an EHS manager and a **dangerous goods manager**, a position that equates to the Dangerous Goods Safety Advisor required by EU regulations. Both individuals advise the site director on the safe storage and transport of hazardous goods while also monitoring compliance with statutory requirements and our own internal standards.

Our EHS managers are also responsible for **monitoring contract warehouses**. Before signing a contract with a third-party warehouse operator, we assess whether they properly adhere to national and international storage and transport regulations and whether they can meet our additional requirements. We summarize the findings from this audit in an EHS report, which contains additional warehouse and storage requirements.

Our commitment: Internal standards and international rules

We have Group-wide standards in place that govern the safety levels for the storage of hazardous substances at our sites. Accompanied by standard operating procedures and best practices, these standards describe the technology and organizational infrastructure needed to achieve the appropriate safety levels.

Contract warehouses must also adhere to our strict safety requirements. Before we sign a contract with an operator, they must submit a statement detailing how they meet our prerequisites. Our Group-wide standards also define the **technical and organizational requirements** for such warehouses.

In Germany, the **storage of packaged hazardous materials** is governed by the Technical Rules for Hazardous Substances ("Storage of hazardous substances in non-stationary containers", TRGS 510), which apply across all our warehouse and distribution centers Group-wide. A completely revised version of the TRGS was published at the beginning of 2021; the update was handled by the Committee on Hazardous Substances (AGS) with input from our company's own experts.

Our Group Transport Safety Standard is based on the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations. This guideline is especially important for sites in those countries with no local regulations covering the **conveyance of hazardous materials**.

All standards are reviewed either as needed or at a minimum every three years and updated to reflect current requirements. When changes are called for, we support our site directors in implementing the relevant modifications at the local level.

During the process of integrating Versum Materials and Intermolecular, we reviewed all relevant standards and made adjustments as necessary. We adopted the vast majority of the special requirements of Versum Materials and Intermolecular. Specifically, these pertained to the storage of gases and the evaluation of highly hazardous materials for transport.

Enhancing transport and warehouse safety

In addition to the inspections conducted by our EHS and dangerous goods managers, we regularly perform internal **risk-based Group audits** to ensure that our sites comply with warehouse and transport safety regulations. We generally conduct these audits every four years, performing them more frequently at sites that pose a potentially higher risk. If major shortcomings are identified, we re-audit the respective site the following year. Conversely, we may decide to extend the period between audits at facilities where, based on the findings from previous audits, we deem the potential risk to be low. Using a standardized checklist, our EHS managers verify whether contract warehouses meet our requirements. This inventory also helps us assess risks before entering into a business relationship with a third-party warehouse.

Due to the Covid-19 pandemic, we were unable to perform all the audits we had planned for 2020. We audited two of our warehouse facilities to verify their compliance with Group-wide standards and also audited one contract warehouse.

We report transportation incidents and accidents in accordance with the United Nations Recommendations on the Transport of Dangerous Goods – Model Regulations (7.1.9) in conjunction with the criteria of the Agreement concerning the International Carriage of Dangerous Goods by Road (ADR, 1.8.5.). There was no reportable incident during 2020.

Employee training and best-practice sharing

In line with their specific tasks and responsibilities, our employees undergo regular training that is conducted by either their respective supervisor or our EHS and dangerous goods managers. Topics include internal standards and procedures, changes to international requirements, and proper incident management.

Across the globe, we conduct around **1,000 internal and external seminars on transport and warehouse safety every year.** Due to the Covid-19 pandemic, only 60% of our seminars could took place. Many of these were rescheduled as webinars. The **e-learning program we developed** for hazardous material transport and storage is compulsory for logistics, EHS and dangerous goods managers. It features ten courses that we assign to the participants to complete.

Our dangerous goods managers hold regular conference calls to share their experiences and discuss current changes. All new EHS managers must complete EHStart-up!, a three-day onboarding seminar on environmental stewardship, safety and safe logistics. In 2020, we held this training online program through a series of webinars.

Ensuring proper transport

We primarily use logistics companies to deliver our products to customers. In Germany, we transport the majority of our hazardous waste ourselves. Furthermore, we participate in the German Transport Accident Reporting and **Emergency Response System** (TUIS) operated by the German Chemical Industry Association (VCI). Within this system, we share chemical transport expertise and best practices with experts from other chemical companies and also render hands-on assistance in the event of a chemical transportation accident. Our site fire departments in Darmstadt and Gernsheim collaborate closely with the fire departments in the region and provide specialized equipment to help in emergency situations.

Employees

Within this chapter:

good leadership

Part of the non-financial report

Good leaders are crucial to the success of not only our employees, but also our company. Because they provide our talent with the right framework to unleash their potential and generate new ideas, we place great importance on the continuing education and development of our managers. Within our company, many teams collaborate across sites and national borders, and therefore fostering global collaboration is a central theme in the professional training and growth of our leaders.

Our approach to good leadership

The People Strategy serves as a basis for our continuous efforts to attract, retain and develop our leaders and our talent. We place special focus on actively engaging and challenging our leaders to become "leaders of people".

Our **strategic competency model** describes the core competencies that underpin the conduct of our employees at all levels of the hierarchy (see diagram).

Our competency model

In our day-to-day work, these core competencies play an important role in our success. The competency model provides the foundation for all our Human Resources programs and processes. Employees and supervisors discuss specific growth and development needs, as well as the progress made with development measures already introduced.

Our competency model is also applicable to our leaders. By setting an example, they play a key role in embedding the competencies across our organization. In addition, the model defines the leadership culture through which we intend to grow our business. Building on this framework, we defined **six leadership behaviors** that summarize the way we expect our leaders to act.

By participating in employee surveys, our employees can also assess various factors, such as leadership quality within the company.

How we facilitate good leadership

We expect our leaders to be attuned to the needs of their diverse teams and therefore provide them with support in the form of resources and data. At the same time, they can access **transparent feedback through specially developed tools** in order to find out about the impact of their behavior. We work with external providers to train our leaders on approaches to good leadership that are scientifically-based and well-established within the business world.

How we structure our human resources management

The Human Resources (HR) department is responsible for advising all business sectors and Group functions. It addresses the needs of our employees, organization and company culture. Across all our sites, HR employees work hand-in-hand with leaders from the various functions and business sectors to develop attractive compensation models and benefits, along with strategies to engage our people even more strongly and in accordance with Group-wide HR guidelines and requirements. Every two to three years, we carry out internal audits to check that the guidelines are being implemented. As we continue to integrate Versum Materials and Intermolecular, we review our HR policies and guidelines and make adjustments as necessary.

Our Vice Chair of the Executive Board and Deputy CEO is responsible for Group Human Resources. Our Chief HR Officer, in charge of the various HR activities, HR experts and HR business partners, reports directly to her. Our Merck Business Services unit oversees the operational tasks of human resources work, such as drafting contracts and payroll accounting. The Executive Board member and Chief Financial Officer is responsible for this unit.

Our commitment

Our six leadership behaviors describe good leadership in our Group. They are based on our corporate strategy, our competency model and our company values. To do this, we analyzed best practices from other companies and compared the leadership behaviors we defined with market standards. We regularly inform executives and employees through global campaigns about the Leadership behaviors. We also integrated these behaviors into all HR processes, such as training, recruitment, and feedback processes.

The pandemic is bringing about far-reaching changes to the world of work

Since the outbreak of the Covid-19 pandemic, our crisis management has revolved around how best to support our staff.

We developed **Group-wide guidelines**, taking into account the different pandemic histories and regulations from country to country. These guidelines regulate the physical presence of employees at the company workplace and working remotely. They contain generally applicable hygiene regulations, support employees to balance work, childcare and family obligations and protect employees with special personal health risks.

We offer our managers guidelines for team discussions in order to adapt internal team collaboration in light of the crisis situation and the changed working conditions. This is meant to create an inclusive atmosphere. In addition, we offer **Group-wide training courses** on "Virtual Leadership", "Employee Welfare" and "Working remotely". We also extended our **telephone social counseling** to all countries. We offer psychological counseling to our employees and their families in the event of mental stress.

From the very beginning of the pandemic, we recognized that the necessary adjustments to our way of working also offered opportunities – for the future development of our working model. As part of our crisis management efforts, we formed the working group **"Future Ways of Working"** in 2020, which aims to make use of the experience gained during the crisis and it is developing principles for our future cooperation, even after the pandemic. The focus is on:

- **Flexible working models**: We want to expand our existing flexible working models throughout the Group. Depending on the area of activity and in agreement with their supervisors, employees should be able to use a hybrid working model. This means they can divide their work time in a balanced way between their workplace and other locations, such as home. In addition, we want to offer our staff an alternative to full-time employment with part-time or job-sharing models. Furthermore, we are creating location-independent roles with defined job requirements so that we can recruit talent in all parts of the world.
- **New technologies**: We continue to invest in new technologies. For example, by increasing the use of artificial intelligence, we are enabling our employees to develop and build new skills that will be critical in the future.
- **Management training**: We will continue to train our managers so that they acquire the necessary skills. This is the only way they can responsibly lead their employees in challenging times.

Management and talent programs for leaders

To **enhance the skills of our people managers,** we offer three different programs:

- The Managerial Foundation Program imparts the basics of leadership, such as communication techniques, leadership

styles, conflict management, motivation, and emotional intelligence.
- The Advanced Management Program covers topics such as change management, self-reflection and resilience.
- Our Global Leadership program focuses on the competencies needed to ensure successful international collaboration.

In 2020, the Managerial Foundation and Advanced Management programs took place worldwide. We conducted the Global Leadership program in China, Germany and the United States.

For 21 years, we have been partnering with top international universities to offer the **Merck University** program. Over a period of one year, senior leaders complete learning modules on management techniques and strategic business development, with 522 senior leaders having participated to date.

Another initiative we have been offering our up-and-coming leaders since the 1990s is our International Management Program, where participants work on an interdisciplinary project over a period of eight months. They present the results of their efforts to the Executive Board. In 2020, 25 of our employees took part in such a project.

In addition to these various programs, we partner with universities across the globe to enable our employees to obtain qualifications such as an Executive MBA.

Our Expert Foundation Program teaches participants the fundamentals of their role as experts in interdisciplinary project groups.

As a result of the Covid-19 pandemic, we have been offering a majority of programs virtually since spring 2020.

Tapping potential in growth markets

In 2020, 17 participants successfully completed "Afrika kommt!", a one-year program offered by the German Society for International Cooperation (GIZ). The program **trains experts and leaders from Africa**. In supporting this initiative, we are helping to build a pool of regional partners to encourage economic cooperation between Germany and Africa. 23 former scholarship recipients are now working for us in various specialist and leadership positions, some of them in African countries and others in Darmstadt. We have selected 11 new candidates for the ninth intake of "Afrika kommt!". They will start their new positions within the Group in June 2021.

Leveraging the opportunities of digitalization

In the human resources area, we use new technologies that support our employees and managers with as many processes as possible.

In 2020, we introduced an updated version of "HR4You", our self-service human resources platform. Thanks to the upgrade and improved user guidance, our employees can **administer and manage** numerous **HR-related processes themselves around the clock**. Our managers can view and independently edit the data of their teams. The new system relieves the burden on both our managers and the HR department, giving them more time to advise employees on strategic decisions.

A complementary function of "HR4You" is the **chatbot "Ad@m"**. Managers can ask questions about selected processes and get answers from the chatbot. The chatbot is designed to be a self-learning system – the more questions it receives, the better it gets over time.

Our managers also use an innovative software application to analyze personnel-related data. This analyzes not only employee master data, but also information on employee compensation, performance and skills, as well as strategic succession and personnel planning. The software uses **Big Data** technology. It links the various data and identifies certain trends at an early stage. The systems adhere to all applicable data privacy rules.

Since 2017, we have been conducting research with the TU Darmstadt on a humanoid intelligent robot. We want to find out how employees and managers respond to intelligent robots and artificial intelligence (AI) in the workplace. Furthermore, we are examining in which areas an application would be conceivable. Our aim is to prepare our workforce for the **introduction of AI** within their working environment. The studies also serve to help make new technologies tangible, thereby paving the way for early acceptance.

career with us

Part of the non-financial report

Globally, our employees drive advances in science and technology. We encourage all of them to pursue the career path that aligns with their individual ambitions, skills and talents. To sustain our success, we endeavor to attract talent who will bring courage, creativity and curiosity to our company.

Our approach to attracting and retaining talent

We believe that curiosity can make great things happen. We therefore seek to provide an environment that gives our employees plenty of **scope for creativity** and sparks their desire to innovate. Our employer brand communicates this mindset to the outside world. Through our slogan "Bring Your Curiosity to Life", we show applicants, whether potential apprentices or university graduates, what they can expect when they join our company. To this end, in Germany we cooperate with regional target universities, student initiatives and associations. In addition, we regularly organize events in order to give students an insight into our company. We also take part in job fairs in Germany and abroad. University graduates can apply for a position with our company directly or complete one of our trainee programs. In addition to recruiting talented students, we also provide financial assistance. For instance, we collaborate with the German Academic Scholarship Foundation (Studienstiftung des deutschen Volkes) and support the scholarships granted by Deutschlandstipendium, an educational initiative of the German federal government.

In addition to our recruiting efforts, the **vocational and advanced training** of our employees also plays an essential role for us. With our People strategy, we make it clear how important curious talent and empowered leaders as well as result-oriented teams and networks are to us. We support the personal and professional development of all employees in line with their strengths, ambitions and competencies, thereby laying the groundwork for an enriching and challenging career with our company. We endeavor to find qualified employees at an early stage in their career and systematically advance them.

Apart from dual education programs, we consider vocational training a key way to meet the **current and future need for qualified professionals**. As competition for young talent grows, job security and marketable professional qualifications are crucial, which is why we continuously invest in new technologies and integrate these into our vocational training programs. If, after completing their apprenticeship, our young employees in Germany wish to continue studying while working, we will cover 75% of the costs and grant them special leave.

How we organize recruiting, vocational training and advanced training

Group Human Resources (HR) supports and advises all business sectors and Group functions within our organization as regards human resources issues. Moreover, we develop strategies to advance our employees, organization and company culture. More information on the structure of HR can be found under Good leadership.

Our **HR4You digital platform**, which can be accessed by all employees, helps us to globally harmonize our HR processes. For instance, the platform allows them to access their personal data. They can use the platform to initiate and steer the Performance and Potential Management Process themselves, participate in online training or apply internally for vacant positions.

Our commitment: Employee development guideline

Our People Development & Learning Policy provides a Group-wide framework within which employees can manage their professional growth. It defines requirements for our development opportunities, roles and responsibilities. The corresponding processes are described in our People Development & Learning Standards.

Providing feedback and supporting development

We regularly provide our employees with performance feedback. The **Performance and Potential Management Process** ensures that, in addition to this regular feedback, a meeting is held once a year to evaluate their overall performance. This process is applicable to all employees Group-wide in Role 2 or higher, and additionally to all non-exempt staff employed by either Merck KGaA or any other subsidiary based in Germany.

Our people managers and their employees agree on **individual annual objectives**. The annual bonus depends on individual performance and objective achievement. Additionally, the bonus calculation also reflects the company's overall performance, which we determine using various company key indicators.

Once the development direction is defined, our managers and their staff create a **detailed development plan**. When drafting the development plan, all employees have access to the Development Advisor. Building on the Merck competencies and Merck leadership behaviors, this digital tool provides a selection of development opportun-

ities that employees can tailor to their own needs. Every employee can thus quickly and easily create their development plan, which displays the respective areas of focus, via HR4You. It is coordinated in accordance with the strategic priorities of the company.

They can additionally collect feedback from selected colleagues and external partners on their personal development. This **360-degree feedback** helps to identify personal strengths and advancement opportunities. Moreover, our people have access to a real-time feedback tool that can be accessed via their PC or smartphone, making it even easier to give and receive feedback. With this tool we intend to help promote a cross-hierarchical feedback culture.

98%

of our employees took part in the Performance and Potential Management Process in 2020, 77% set up an approved development plan.

Employee learning and education

Our Group-wide advanced training and continuing education program ensures that our employees develop the skills and abilities needed to help us realize our company strategy. As part of their **individual development plan**, our employees can use our learning management system to register for seminars and e-learning courses. In 2020, 93% of our employees took part in approximately 4 million training courses.

Due to the Covid-19 pandemic, we reorganized our classroom training courses into virtual formats. These courses are flexible, meaning that while the core curriculum is uniform Group-wide, there is still room for site-specific modifications. Moreover, we launched a new virtual and free learning format: Since the start of 2020, our employees have been able to participate in special courses on the career platform LinkedIn.

We constantly adapt our offers to meet the individual learning needs of our employees and the strategic priorities of our company. We are in the process of revising our advanced training courses. We are planning to develop a new, interdisciplinary program by 2022. This should enable our staff to have the necessary competencies and relevant skills to remain employable in the future. At the same time, we would like our employees to develop according to their individual needs.

Performance-based pay

We reward the performance of our employees so as to maintain a competitive edge in attracting qualified professionals. Within our Group, compensation is based on the requirements of each position as well as each employee's respective performance. In addition to competitive pay, we offer attractive fringe and social benefits. Our benefits4me package consists of three pillars, namely company-funded benefits, including our company pension plan, health and well-being offerings and services, for instance bicycle or IT hardware leasing offers. To meet the multifaceted needs of our workforce, we offer a **variety of benefit packages worldwide.**

To ensure a **competitive remuneration structure**, we regularly review our compensation policy based on data analyses and benchmarks. In doing so, we take internal factors and market requirements equally into account. Before adapting our remuneration structure, we consult with key stakeholders, such as employee representatives. The pay structures within our company are based on defined criteria, such as job requirements and performance. We do not make any distinctions based on gender or other diversity criteria.

Sparking young people's interest in our company

We employ trainees in units such as Inhouse Consulting, Finance, Production, Marketing, Sales, Procurement, Human Resources, as well as Research and Development. Additional functions can be added as required.

Our GOglobal trainee program **enables university graduates to join our company as trainees**. Within 24 months, these entry-level employees get to know various departments and functions. Centered on China, Germany and the United States, the program offers international assignments, individual continuing education, mentoring, and coaching.

The "OLDP" training program (Operations Leadership Development Program) in our Life Science business sector is structured similarly to the GOglobal program and offers comparable benefits. However, the focus is on production and logistics.

To cultivate **young academic talent**, we also offer internships in all departments to university students. Interns who perform exceptionally well are enrolled in our talent-retention program. Besides these programs, we also offer university students jobs as working students and the opportunity to complete their bachelor's, master's or doctoral thesis while working at our company. In addition, we regularly invite university students to various events, where we present the different occupational areas within our Group and ways to join the company.

Vocational training and dual education programs

We offer apprenticeships across 28 occupations, primarily in production, laboratory work and office administration. Furthermore, we enable young adults to pursue a dual education program in the fields of business administration, business IT, process engineering (chemical engineering), and mechanical engineering. Apprentices in the Laboratory group begin their training as chemistry or biology lab technicians and, subject to suitability, may receive the opportunity to start a dual education program after six months. Since 2014, we have been offering permanent employment contracts to all **apprentices and graduates of dual**

education programs in occupations for which we have long-term demand. In 2020, the hiring rate for graduates of these programs – taking voluntary terminations into account – was above 90%.

Special vocational training opportunities

In Darmstadt, our "Start in die Ausbildung" and "Integrating refugees through training" programs help prepare young people for the labor market. We offer them the opportunity to complete an 11-month program with our company, **gaining insight into the world of work and improving their qualifications for vocational training**. On the one hand, we support young people who have earned a high school diploma but have searched for an apprenticeship for at least one year without success. On the other hand, we help refugees who had to leave their countries of origin and would like to build a new life in Germany. In 2020, we combined the two programs under the name "Start in die Ausbildung" so that participants can learn and benefit from one another. In 2020, we combined the two programs under the name "Start in die Ausbildung" so that participants learn and benefit from one another. The benefits: mutual cultural sensitization and language support through personal exchange with native speakers and the example set by highly motivated people. In 2020, we hired participants between the ages of 16 and 30.

Digitalization in recruiting, vocational and advanced training

Digital media enabled many things for us during the lockdown phase of the Covid-19 pandemic: We paved new paths both in recruiting and in vocational and advanced training.

We are now implementing digital approaches to selected steps of the recruitment process, such as virtual job interviews and assessment centers. This is how we protect the health of our employees and applicants and, at the same time, continue the recruiting process efficiently. As a result, we prevented delays in current selection processes. We created guidelines for candidates and offered time with recruiters, to support them in preparing for video interviews.

To accompany and strengthen our employees during the Covid-19 pandemic, we provide **free digital continuing education and training offers** in addition to the LinkedIn courses: "Self-motivation in challenging times" and "Making responsibility count".

In professional training, we adapted plans of action in light of the pandemic and increasingly used virtual learning formats. This strengthens us when it comes to integrating topics, such as **robotics**, **Big Data** or **artificial intelligence** (AI) into our curricula. To learn how to operate plants, our apprentices also use virtual reality environments. Initially, they practice operating the systems using a virtual reality display before applying and furthering their new skills in the actual operating environment.

Fairness and dialogue

Part of the non-financial report

We greatly value the perspective of our employees – which is why we actively engage them in our efforts to advance our company. In this context, feedback from every individual helps us pinpoint the areas where we can do better. At the same time, through an open culture of dialogue, we build a creative and innovative working environment in which our employees can contribute their diverse ideas. Dealing with one another fairly and respectfully always forms the basis of our actions.

Our approach to employee engagement

We seek to understand the needs of the people who work for us and therefore regularly conduct **employee surveys**, both Group-wide and within select countries, individual business sectors or specific projects. These surveys are an important building block of our corporate feedback culture because they help to facilitate communication between managers and employees and also show us areas where we can improve.

Our Social and Labor Standards Policy further bolsters the foundation for fair and open interactions with our employees.

How we engage our employees

The Engagement and Inclusion unit within our HR organization is responsible for employee engagement, diversity and inclusion, and also develops and manages our employee surveys.

We include **local employee representatives** in our company's decision-making processes, doing so regularly and extensively. Within Germany 13 of our subsidiaries have employee representation, while 26 of our subsidiaries across eight other European nations have employee representative bodies (Austria, Belgium, France, Ireland, Italy, the Netherlands, Spain, and Switzerland). In Germany, 60% of all employees are covered by collective agreements (14% of our workforce). Local works councils as well as a Group works council represent our employees, discussing topics such as compensation, working hours and organizational realignments. The Senior Executives Committee advocates for the interests of our top leaders in Germany, while the Euroforum represents our employees at the European level. Focusing on the economic situation, employment rates and significant changes within our Group, this body covers all EU countries as well as Switzerland and Norway, although not all countries have their own delegate.

Our commitment: Group-wide Social and Labor Standards Policy

We are dedicated to upholding the appropriate and **fair labor and social standards** that are stipulated in our Group-wide Social and Labor Standards Policy. It complements the provisions of the Merck Human Rights Charter and our Code of Conduct with respect to labor and social standards. These include the fundamental conventions of the International Labour Organization (ILO), which cover freedom of association and collective bargaining, forced labor, child labor, anti-discrimination, equal opportunity, equal pay, working hours, occupational health and safety, and the prevention of abuse and harassment. The Social and Labor Standards Policy makes it clear that we do not tolerate any form of discrimination, physical or verbal harassment or intolerance in the workplace. In this way, it creates the framework for fair and respectful interaction. We conduct internal audits to ensure that our local subsidiaries comply with these principles.

Understanding our employees

Every year, we conduct Group-wide confidential and voluntary employee surveys. The **regular exchange** between our employees, managers and leaders provides a valuable information base for improving the working environment and business processes. The survey conducted in 2020 revealed that 77% of our employees feel engaged with our company; around 50,500 people (86%) took part in the survey.

The Covid-19 pandemic poses significant challenges for us and our employees. We therefore asked them about their experiences so far and wanted to know how they assess our handling of the pandemic. In 2020, we conducted two additional pulse surveys among our employees worldwide. Among other things, we asked employees whether our internal communication on the pandemic is clear and comprehensible, whether hygiene rules have been communicated sufficiently, and whether supportive training offers are adequate. 90% of the participating employees (53% of all employees worldwide) rated these aspects positively. We also asked whether they felt sufficiently supported by their supervisors and what they had personally learned from the crisis.

Encouraging and rewarding ideas

Our company has a long tradition of rewarding ideas. In 1853, we became the first industrial company in the world to contractually stipulate **bonuses for successful employee implemented suggestions for improvement**, and approximately 60 years ago we laid out company agreements stipulating principles and rules for our ideation efforts. Our idea management program seeks to inspire our employees to think creatively and encourage them to

contribute to the continuous improvement of our company procedures and processes.

Every year, we present **awards** to our employees in recognition of outstanding ideas, teamwork and projects.

Keeping employees informed and encouraging dialogue

We keep our employees throughout the Group up-to-date and encourage **exchange** through a number of formats tailored to specific target groups. Examples include our intranet or our international employee magazine "pro", which is published in seven languages and is available in a digital format as well as an app. The magazine also offers podcasts on important company topics. "pro" has a readership covering more than 90% of our approximately 58,000 employees worldwide in their local language. There are also local editions in some countries.

EVA is our global intranet, which is also accessible without PC access via mobile devices. Receiving approximately 2 million visits per month, EVA provides relevant information and materials, organized by business sector, function and strategic topic. A software enables the automatic translation of news articles into 22 languages, making it easier for the people who work for us to communicate worldwide.

diversity and inclusion

Part of the non-financial report

We believe the diversity of our employees enriches our company, be it with respect to their gender, national or ethnic origin, sexual orientation, religion, or personal life experiences. We advocate for an inclusive culture in which each individual can realize their full potential and bring their own individual perspectives to the table. We are convinced that the diversity of our workforce and our open, international company culture have a positive impact on the business success and innovative strength of our company.

Our approach to diversity and inclusion

We are committed to strengthening and expanding our **inclusive culture** and the diversity of our workforce. That is why we are pursuing our diversity and inclusion strategy (D&I strategy), which consists of three pillars: Firstly, attracting, developing and retaining the best employees, secondly, serving various customers and markets and thirdly, driving forward innovations through inclusion.

In line with our corporate strategy, our objective is to **increase the proportion of women in leadership roles** and offer better opportunities to talent from Asia. Additionally, we want to deepen our understanding of this growth market. In 2020, our Diversity Council expanded its focus to include LGBTQI+, disability and ethnicity issues. In North America and Europe, we concentrated on the topic of ethnic origin in 2020 and organized dialogue in various forums.

Moreover, we take action against all forms of discrimination, build teams with a balanced age structure and a diverse base of educational backgrounds and experience and create an international working environment. As part of our D&I strategy, we also encourage our managers to actively promote diversity. Diversity figures are therefore part of the compensation-relevant corporate goals.

We integrate this inclusion concept into all Human Resources programs and processes. Our Competency Model shows how managers and employees can establish an open and inclusive environment. The inclusion concept is thus embedded in our six Leadership Behaviors. This concept explicitly calls for open and supportive collaboration.

We advocate for **openness and diversity**. For this purpose, we work on recognizing unconscious bias and its impact on everyday work. We use training courses to raise awareness of this among managers and show how these biases can be actively addressed, both in interpersonal relations and decision-making processes.

Our diverse **employee networks** are a further component for creating an inclusive culture. Several thousand people are members of these networks. We encourage the formation of new networks as the exchange with them helps us to recognize the challenges our employees face in everyday work.

In addition, we also regularly host our Diversity Days and use various occasions, such as International Women's Day, Pride Month, Coming Out Day, and Black History Month to host further events, where we explain the current developments that are relevant to us. We derive specific measures from the insights gained in order to embed inclusion even more deeply in our company.

Making diversity and inclusion a pillar of the company

Our Chief Diversity Officer is responsible for steering topics of diversity and inclusion. She reports directly to the Vice Chair of the Executive Board and Deputy CEO whose responsibilities include Group Human Resources. The Diversity Council consists of **high-ranking executives** from all our business sectors and select Group functions. The committee has the following mandate:

- The committee members visibly and actively support our diversity and inclusion agenda as well as the Executive Board and the managing directors in the individual countries.
- The members propose strategic goals, initiate measures and ensure within their respective units that line managers meet their responsibilities.
- The members use the Diversity Council to exchange information, discuss the latest challenges and share best practices.
- The members are accessible to all employees.
- As leaders of our company, the members are role models within their units.

In addition, all business sectors and major Group functions have various working groups at management level, which implement the diversity and inclusion strategy in their area of responsibility.

Our commitment: Industry-wide initiatives and regulations

Our Social and Labor Standards Policy makes it clear that we **do not tolerate any form of discrimination**, physical or verbal harassment or intolerance. To underscore our commitment to equality, fairness, inclusion, and tolerance in the workplace, we additionally participate in industry-wide initiatives.

- The Women's Empowerment Principles, an initiative of UN Women and the UN Global Compact network, are to promote gender equality and women's empowerment in the workplace.
- The "Inclusion Action Plan" of the German Mining, Chemical and Energy Industrial Union (IG BCE) defines concrete measures to create a more inclusive workforce for employees with disabilities. In endorsing this plan, we are meeting the requirements of the United Nations Convention on the Rights of Persons with Disabilities.
- The Equal Opportunity Charter, with which we promise to do everything in our power to achieve gender equality within our company.
- The German "Diversity Charter", with which we promise to embed diversity and inclusion in our organization. In 2020, we became a new, official member of the association Charta der Vielfalt e. V.

Moreover, we became a signatory to the Business Coalition for the Equality Act, an alliance of leading U.S. companies.

Meeting statutory requirements

The German Law for the Equal Participation of Women and Men in Leadership Positions in the Public and Private Sector has been in effect in Germany since 2015. Owing to our legal form as a KGaA (corporation with general partners), this law also applies in part to us. Detailed information can be found on our website.

Consisting of 37.5% women (six out of 16 members), our Supervisory Board already meets the stipulations of German **legislation on the gender quota**. Owing to our legal form as a KGaA (corporation with general partners), we are not required to set targets for our Executive Board.

For the two management levels below the Executive Board of Merck KGaA, however, the Executive Board set the following targets in 2016:

- 21% women on the first management level of Merck KGaA below the Executive Board
- 26% women on the second management level below the Executive Board

The deadline set for reaching these targets is December 31, 2021.

Rooting out unconscious bias

We want to raise awareness of **unconscious bias** among our managers and employees. That is why we offer Group-wide training courses on this topic. When filling job vacancies worldwide, the online tool "Job Analyzer" supports **gender-neutral communication** with applicants. This is intended to reduce unconscious bias in the hiring process.

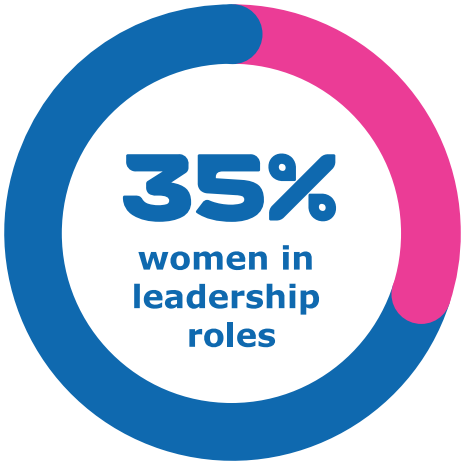
Taking action against discrimination

We do not tolerate any discrimination in our company. This is stipulated with binding effect in our Code of Conduct and our Social and Labor Standards Policy. If employees feel discriminated against, harassed or not tolerated, they can **report the issue via various channels**: Their first points of contact are either their supervisor or one of the two Group functions Human Resources (HR) or Compliance. Alternatively, employees throughout the Group can call our SpeakUp Line anonymously. As part of our "Group Compliance Case Committee", our Group HR function coordinates suspected cases relating to HR. In 2020, 16 suspected cases of discrimination were reported via SpeakUp Line and other channels. Of these reports, two incidents were confirmed.

Fostering diverse talent

HR supports our business units in fostering talent of various origins and increasing the proportion of women in leadership roles. At the end of 2020, 35% of the managers in the Group were women, which means we exceeded our 2021 target of maintaining a 30% representation of women in these positions.

Women in management



22% in senior management

35% in middle management

In 2020, we developed Group-wide goals and measures to achieve a more balanced gender structure in various hierarchical levels of our business sectors. For example, we offered numerous **mentoring, sponsoring and talent programs** for women and other target groups, such as ethnic minorities. In doing so, we want to make these target groups more visible when filling vacancies. Mentoring programs help participants to exchange views on solutions for current challenges. Sponsoring programs go beyond this. Here, participants benefit from an experienced people manager who coaches them and prepares them for the next career step.

We are convinced that our talent programs and open discussions about unconscious bias contribute to further increasing the diversity of the workforce in our company. In 2020, we reviewed our Group-wide recruitment processes to identify the measures and products that make our processes even more inclusive.

Our employees have the option of working flexibly – this also contributes to more equal opportunities. During the Covid-19 pandemic, we expanded our flexible job offers. Additionally, we offer our employees information, e.g. about virtual working or mental health, in order to support them in various personal circumstances. Moreover, we supported research on gender-based violence.

Networks strengthen diversity

We support numerous local and global **employee networks,** including our internal women's networks and networks that advocate for the LGBTQI+ community, employees of various ethnic origins and international employees. Networks for people with disabilities and veterans are in development.

Involvement in area-specific or interdisciplinary networks is an opportunity for all employees to acquire leadership competencies. At the same time, they bring their experience into our company. We therefore ensure that the various groups are listened to and incorporated.

Networks for more diversity

Women Networks

Create an inclusive workplace that recognizes, develops and promotes qualified women to achieve gender balance and thus long-term business success

International Community

A community of open-minded individuals who share experiences, connect, and exchange information to support a soft landing at our site in Darmstadt

Embracing Carers

Focus on improving carer's health and wellbeing, while increasing awareness and support for them within healthcare systems around the globe

Rainbow Networks

Promote a safe and inclusive network environment and foster a community where LGBTQI+ employees and their allies are recognized and valued

Race & Ethnicity Networks

Help solve our diversity and inclusion challenges by proposing solutions to support the attraction, retention and promotion of employees of various ethnic groups

Tapping into external networks

For more than ten years now, our company has been a corporate partner of the Healthcare Businesswomen's Association (HBA). We are represented both in global and European advisory boards. The HBA advocates for women in the healthcare industry – almost exclusively through volunteer work. We explicitly support employees who want to volunteer for the HBA. In 2020, employees in Germany, the Netherlands, Switzerland, and the United States volunteered for the HBA – some as members of the European Regional Council, some as European Regional Chairpersons and some has heads of a regional HBA group. Moreover, we sponsor the events of the HBA.

Integrating international employees

Our company is becoming increasingly international. We currently employ people from a total of 141 nations. Our leadership (Role 4+) includes representatives of 75 nationalities. In 2020, 66% of leadership positions were held by non-German employees. As of the end of 2020, 9% of our workforce worked outside their home countries.

To best facilitate this international collaboration, we offer **intercultural training** for all employees along with suitable digital tools. For instance, our Cultural Navigator helps prepare our staff for international projects and business trips abroad. To help employees transferred abroad to adjust more quickly, we offer language training and international networks. For instance, more than 700 expatriate employees are members of the International Community, which meets regularly in Darmstadt.

Our business language is English. To ensure that the members of our workforce understand our communications, we also provide a great deal of information in the respective local languages of our employees.

Good ranking in diversity and equality indices

The American Human Rights Campaign Foundation rated our LGBTQI+ activities throughout 2020. We scored 100% in the "Corporate Equality Index" (CEI), which measured the equality and inclusion of our LGBTQI+ employees.

In the Financial Times ranking, we were selected as one of the leading 100 (out of over 15,000) companies when it comes to the topic of diversity.

We ranked third in the 2020 "BCG Gender Diversity Study" by the Boston Consulting Group and the Technical University of Munich. This study rated management board and supervisory board gender diversity among Germany's largest publicly listed companies.

These rankings show us that we are on the right track when it comes to successfully living diversity and an inclusive work environment.

work-life balance

Part of the non-financial report

We know that priorities in life can shift. That is why we are considerate of such changes, offering our employees a range of options, such as flexible working hour models, working hour accounts for early retirement or the possibility to take an extended leave of absence. As regards family topics, we support employees through generous parental leave, childcare and assistance in finding nursing care for family members.

Our approach to ensuring a good work-life balance

We realize how important work-life balance is for a productive and motivated workforce, which is why we seek to offer our people the best possible working conditions. This includes both company health and pension benefits as well as flexible working hour models. In many countries, our employees can already flexibly set their own working hours, making use of **more than 30 different part-time working models**. In Germany, the United States, Brazil, and India, where around 53% of our workforce is based, we offer parental leave conditions that exceed the respective minimum statutory requirements.

How we strengthen work-life balance

Group Human Resources (HR) develops and also implements measures for a healthy work-life balance. For instance, it provides relevant support and advice to employees throughout the Group.

In personal appointments, company experts assist our employees with retirement planning matters, for instance company pension benefits or long-term accounts. Representatives from the German statutory pension insurance system also visit our premises regularly to discuss statutory pension matters with employees.

More information on the topic of healthcare benefits can be found under Health and safety.

Our commitment: Group guidelines and local regulations

Our Social and Labor Standards Policy harmonizes certain labor standards Group-wide, for instance on working hours and parental leave options. It is oriented towards the labor standards of the International Labour Organization (ILO).

At the end of 2018, our Executive Board had already adopted a Group-wide guideline on flexible working models. As a consequence, this created even greater working hour and location flexibility in the 13 countries where around 75% of our employees work. We are currently revising this guideline in order to expand it by 2021 to all countries in which we operate (more details can be found in the following section).

Flexible working models

Prior to the Covid-19 pandemic, our employees could choose between various flexible working models. Our experiences in terms of employee performance and engagement during the pandemic were positive across the board. That is why we will launch our well-established "mywork@Merck" program at all our sites around the world by the end of 2021. At the end of 2020, 22 countries were already using our flexible working model.

The mywork@Merck program allows employees to freely choose their working hours and location (in the same country) in agreement with the teams and supervisors. Together with their respective supervisors, the teams can decide for themselves when and how often physical presence in the office is necessary for all members. We no longer record or monitor working hours. The model applies to non-exempt and exempt employees and strengthens the **culture of performance and trust in** our company. It is also part of our Group-wide "Future Ways of Working" program, through which we are developing principles for our future collaboration.

Supporting mothers and fathers

We want to make it easier for our employees to return to work after parental leave, which is why we offer a program for parents in Darmstadt and Gernsheim (Germany). It gives mothers and fathers on parental leave the chance to interact while also helping them stay in touch with the company. In addition, they can make use of various **training and networking opportunities**. We have established a similar program in the United States.

Moreover, we offer female employees in the United States eight weeks of paid maternity leave. In addition, we have introduced five weeks of paid paternity or adoption leave there. By contrast, the statutory minimum requirement only provides for 12 weeks of unpaid parental leave per year. In the case of an adoption, we also reimburse up to US$ 5,000 in adoption fees.

In 2020, 538 employees of Merck KGaA (around 15% of our workforce) were on parental leave, around 50% of whom were men. In other key countries, we grant additional support benefits that **exceed the legal requirements**, such as unpaid parental leave for employees in Brazil. In India, too, we offer five days of paid paternity leave even though it is not legally required.

In offering these benefits, we do not differentiate between full- and part-time staff or employees with fixed-term contracts. The latter may apply for parental leave until

the end of their employment contract, with their employment continuing as agreed until the contract ends.

Childcare and support

For more than 50 years, a **daycare center for children** aged 1-12 has been located at our global headquarters in Darmstadt. It offers 150 places in the crèche, nursery school and school aftercare program. The current building will make room for a new one, which is scheduled for completion in early 2021. The capacity of the daycare center will then increase to 270 places.

In Darmstadt we furthermore offer an **emergency childcare service** to cover when regular childcare is not available. In addition, we offer the possibility of in-home care for acutely ill children. For up to two days a year, parents throughout Germany can engage the services of a trained educator free of charge to look after their children at home. Five places at a public daycare center are reserved for the children of our employees in Gernsheim.

Our facility in Mumbai, our main site in India, also has a **daycare center** for the children of our employees. In the United States, parents can visit the digital platform care.com to book external childcare. Furthermore, in the United States, we offer up to ten days of emergency childcare, as well as discounted daycare center places and childcare in the home.

Saving for retirement through a long-term account

We enable our employees in Germany to reduce their working hours before retirement or retire earlier by drawing on a **long-term account**. For instance, they can deposit salary components or comp days into the account. On top of this, our company provides subsidies to encourage the use of these long-term accounts. Employees can then utilize the accrued balance to stop working up to three years before regular retirement or reduce their working hours by 50% for up to six years. In 2020, more than 10,000 employees made use of this option.

Making sabbaticals possible

In principle, all employees of Merck KGaA, Merck Healthcare KGaA and Merck Real Estate GmbH in Germany (around 20% of our workforce) can apply for a **sabbatical**, which gives them up to one year off from work. At the end of 2020, 62 employees were on sabbatical. For personal emergencies in which an employee needs an immediate leave of absence, we additionally offer an emergency sabbatical of up to three months.

Assistance with family nursing and elder care

For our employees in Darmstadt who are caring for family members, we provide **special seminars and family care services**. Moreover, through our family leave model, we offer employees throughout Germany the possibility to take a short- or long-term leave of absence, either part-time or full-time. Our employees in the United States can use the platform care.com to find information about nursing care services.

Health and safety

Part of the non-financial report

We take responsibility for the health and safety of our employees every single day, especially when faced with new challenges such as the Covid-19 pandemic. We do everything we possibly can to safeguard them against both accidents and work-related illnesses. With a view to stress prevention, nutrition and exercise, we help our people avoid health problems through steps that are easy to integrate into their daily work routine.

Our approach to preventing accidents and promoting health

We seek to promote the health and well-being of our employees and sustain their ability to perform over the long term, which necessitates a safe workplace. We are therefore constantly working to take our **safety culture** to the next level.

Before starting any activity worldwide, we perform a hazard assessment to identify risks and do everything possible to eliminate them before commencing the activity or commissioning a plant. If this is not feasible, we put measures in place to minimize the potential impacts. Such hazard assessments are the responsibility of our individual sites and are therefore conducted by them. We are in the process of establishing this procedure at our Versum Materials and Intermolecular sites.

The **lost time injury rate** (LTIR) is the indicator used to gauge the success of our occupational safety efforts. This figure is a global measure of the number of accidents resulting in at least one day of missed work per one million man-hours. We track the LTIR for both employees and temporary staff. Our previous goal was to lower our LTIR to 1.5 (accidents resulting in at least one day of missed work per one million man-hours) by 2020. Having achieved an LTIR of 1.3 in 2020, we once again succeeded in remaining below the ambitious target. We are now working on a new target for the future.

We use our Environment, Health and Safety Incident Rate (EHS IR) to track unplanned accidents. Alongside this indicator, since 2019 we have also been using the Occupational Illness Rate in the United States to monitor work-related illnesses and their long-term effects.

At our Darmstadt and Gernsheim sites, we continued to pursue our BeSafe! program in 2020, giving it new direction and impetus. In line with the motto "Let's keep each other safe", we are striving to bolster team spirit and empower our people to be mindful of one another.

Through the efforts of our Health Management (HM) unit, we are bolstering our company and leadership culture at Darmstadt and Gernsheim. To verify the efficacy of HM's initiatives and programs, we have developed a **performance indicator system.** In 2020, we once more included questions regarding employee health in our Group-wide, anonymous employee engagement survey. In the long run, we intend to use this input to calculate our Healthiness Index, which should reflect the general state of health of our workforce at both of these sites. HM utilizes the health-related results of the employee engagement survey, the findings from our company health insurance fund's health report, and evaluations from our Site Medical Center to advise the leadership at Darmstadt and Gernsheim. When specific indicators such as workplace stress start rising, Health Management meets with the respective units to discuss ways to rectify the situation. We utilize all the findings in the creation of **prevention programs tailored to specific target groups or facilities**.

In the coming years, we will be focusing particularly on shift work, mental health issues and demographic change. Moreover, we plan to identify in which working areas certain illnesses occur frequently so that we can take targeted steps to eliminate the root causes.

How we manage occupational health and safety

Our Environment, Health and Safety (EHS) management system is the responsibility of our Group Environment, Health, Safety, Security, Quality (EQ) function, which reports to the Vice Chair of the Executive Board and Deputy CEO. EQ sets objectives, globally oversees the respective initiatives, and conducts internal EHS audits, while **local EHS managers** and their teams ensure that our individual sites comply with occupational safety laws and regulations. They are also responsible for local projects, campaigns and programs.

Employees worried about their health or safety are encouraged to use our global SpeakUp Line and are also allowed to temporarily step back from their work until the issue has been resolved.

At our Darmstadt site, we also have safety councils and committees that meet to address health and safety issues, discussing strategy and focus areas with senior leaders, health and safety experts, and employees.

At our Darmstadt and Gernsheim sites, our **Health Management unit** helps embed health awareness in our company culture. The appropriate strategy, individual focal areas and steps required are developed by an interdisciplinary steering committee consisting of various senior leaders. Meeting six times a year, the committee discusses topics such as workplace health fundamentals, good leadership and tailored approaches to promoting employee health. After implementing each measure, Health Management team asks all participants for their anonymous feedback and

suggestions for improvement, which help shape the evolution and growth of the initiatives.

At both of these sites, our **interdisciplinary Mental Health Team** is working to tackle the growing challenges surrounding mental health in an effort to protect our workforce against psychological stress. Our Mental Health Team provides our people interdisciplinary support from a single source. In 2020, for instance, we offered mental health seminars. With the Covid-19 lockdown causing many of our employees anxiety and uncertainty, our Mental Health Team published extensive information on coping with the situation and maintaining a healthy mental state on our intranet. Moreover, we set up a telephone hotline for each country. Since then, our employees and their families have had access to confidential counseling services around the clock.

Safety officers and health partners

At our sites worldwide, we have employees who, in addition to their usual duties, help their supervisors ensure compliance with safety regulations and requirements. At the same time, they also act as points of contact for their colleagues regarding safety-related matters. In 2020, we surveyed our safety officers about their roles and responsibilities in order to identify unmet needs and determine the necessary steps going forward.

At our sites in Darmstadt and Gernsheim, we also have health partners in place who are the interface between our employees and Health Management. They function as a health-related liaison for their colleagues while also informing their teams about the health programs and services on offer. They furthermore make recommendations to Health Management regarding employee needs.

Our employees undergo training before taking up their role as safety officer or health partner.

Our commitment: Policies and company agreements

Defining our principles and strategies for environment, health and safety (EHS), our Group EHS Policy is an integral part of our EHS management system, which undergoes an external ISO 45001 audit every year.

Our Group Health Policy details our approach to ensuring workplace safety for our employees while also promoting their health and well-being. This document sets out our **Group-wide approach to health and safety management**, which is aimed at preventing workplace accidents and occupational illnesses. One component of the policy is our Global Well-being and Health Promotion Framework, which describes the differing requirements in a wide array of countries. Our individual sites are responsible for performing local workplace risk assessments and hazard analyses.

In 2020, we furthermore introduced our internal Contractor EHS Management standard, which has replaced EHS Compliance for Contractor Management. This new standard helps us ensure that our contractors adhere to environment, health and safety requirements throughout the entire process, from starting a task to completion. Alongside this document, our new standard operating procedure entitled "Procedure Construction Safety" clearly lays out practices for safe conduct on construction sites.

At most of our facilities in Germany, we work in partnership with employee representatives to draw up **company agreements** on occupational health and safety. For instance, our Occupational Integration Management company agreement, which applies to all our sites in Germany, governs the procedure for employees who have been on extended sick leave. This approach aims to retain an employee's position while also helping to prevent adverse health impacts after the respective employee returns to work.

Safety certification at our sites

In 2020, we transitioned our occupational health and safety management system to the new **ISO 45001 occupational health and safety certification guideline**, which has replaced the previously applicable OHSAS 18001. Our occupational health and safety management system is currently ISO 45001-certified at 42 sites. At 41 of these facilities, 100% of employees are covered by this certified system. At our global headquarters in Darmstadt, ISO 45001 covers around 70% of the workforce; the occupational health and safety of the remaining 30% of Darmstadt employees, who do not work in operating units, are safeguarded by our company's management system. The certification process helps us pinpoint weak areas and identify scope for improvement, allowing us to take the necessary steps in a timely fashion to ensure the health and safety of our employees going forward. Other sites are also urged to apply this standard.

Accident rates

At our sites, we track occupational safety data on a monthly basis. Our employees are required to immediately report relevant occupational accidents to EQ, where the incidents are assessed. If necessary, we then implement additional safety measures at our sites. This procedure is an integral practice across all of our production facilities around the world.

The majority of incidents resulting in lost time were slips, trips and falls, along with contusions and lacerations from the operation of machinery and equipment. In 2020, we recorded no fatal accidents.

Clear rules of conduct

Experience shows that most workplace accidents can be prevented by proper conduct. For our occupational health and safety, it is therefore essential that our employees have the relevant EHS training and certification. We educate our employees on occupational health and safety, actively engaging them in our efforts. For instance, we invite them to participate in inspections together or in the selection of personal protective gear. This involvement is crucial because our people best understand their actual working conditions and what is needed, enabling us to constantly improve our occupational health and safety practices and performance.

Group-wide, all new EHS managers must complete a three-day EHS onboarding that covers topics such as occupational health and safety as well as our **BeSafe! safety culture program**. Through this initiative, we raise employee awareness of workplace dangers and teach them rules for safe behavior. Nearly all our manufacturing and warehouse facilities have now been incorporated into the BeSafe! program. In addition, our sites regularly conduct occupational safety training that covers both the specific local risks and legal requirements. Due to the Covid-19 pandemic, we had to cancel many on-site activities in 2020 and instead held all BeSafe! workshops virtually.

Promoting employee health

For employees at our sites in Darmstadt and Gernsheim, our Health Management unit offers specific health services such as mindfulness courses and workplace ergonomics consultation. Moreover, we use a standard operating procedure to continuously assess the working conditions and environment of our employees and improve these in line with the latest scientific findings. We publish a health catalog in both English and German detailing our Health Management services, which cover topics such as ergonomics, nutrition, stress, and mental health issues.

During the Covid-19 pandemic, we have been educating our employees on a wide array of health matters, including recommendations on ergonomic design of the remote office setting, nutrition and fitness.

Fitness initiatives

Across Germany, our people can take advantage of offerings such as our company fitness program, which encompasses a range of **health prevention courses** that are subsidized by our company. Moreover, in Darmstadt and Gernsheim, we have a company sports program that currently features 33 different types of athletic activity.

In 2020, we continued our Training Island project. Featuring buses converted into **mobile gyms**, participants are able to work out twice a week with a professional trainer in close proximity to their workplace. The program is designed in particular to prevent musculoskeletal disorders while also educating employees about exercise and nutrition. In March 2020, we had to suspend this offer due to the Covid-19 pandemic. However, in its place, we offered the option of personal training sessions via video chat.

In Taiwan, we offer an array of fitness programs under the banner of "Enrich your health deposit". Our site in Gillingham (United Kingdom) has an initiative in place that encourages employees to cycle to work and do something good for their health. In Tokyo (Japan), we offer special anti-stress programs to promote employee mental health.

Ergonomics training

We regularly assess the ergonomics of individual workstations, taking appropriate measures as required. Our employees also receive training on **occupational ergonomics** tailored to specific areas, whether manufacturing, administration, laboratories or when working from home. Moreover, we offer employees at many sites the opportunity to participate in special ergonomics training courses such as the Industrial Athlete program in the United States, which helps employees improve their physical and general well-being.

Examinations and support for our employees

Our Physical Ability Test and Health Preservation process allows us to ensure that all employees meet the health requirements for their particular tasks and duties. Due to new laws and stricter data privacy requirements, only some of our employees are required to undergo **pre-hiring physicals and physical aptitude examinations**. In light of these changes, we have adapted our approach. Our Travel Health & Medical Advisory Service, another program we offer, assists employees who spend time abroad on company business, providing them with recommendations on necessary vaccinations and advice on hygiene risks.

Rising to the challenges of demographic change

We expect the average age within our Group to continue to rise in the coming years. In Germany, we are responding to this trend by designing workspaces that help employees stay healthy and physically fit, thereby maintaining their performance. To inform our approach, we utilize an analysis tool that takes demographic shifts into account by assessing various age-related stress factors, which in turn enables us to **adapt our workplaces to suit the needs of older individuals**. Furthermore, we also offer innovative shift models and a prevention program for shift workers.

Handling Covid-19

To cope with the Covid-19 pandemic, we have established **global and local work groups** to develop risk scenarios and action plans. Among other measures, we have set up **internal Covid-19 testing centers** at Darmstadt and other sites, where our business critical employees undergo regular testing or have access to special testing in cases of suspected infection.

Enhanced protective measures

During the pandemic, we have developed **special occupational safety standards** for numerous sites covering all functional units (offices, laboratories and manufacturing facilities). We have used our intranet along with notice boards to keep our workforce informed of specific behavioral protocols.

To mitigate our employees' risk of infection during the pandemic, we have been offering them personal protective equipment (PPE). A special PPE work group has ensured that the equipment be distributed in the correct quantity according to specific needs. For instance, we shipped face masks for personal and work use to the home addresses of our employees working at the Darmstadt and Gernsheim sites.

In 2020, we furthermore tightened up our travel guidelines Group-wide in order to protect our workforce.

In India and Italy, for instance, we expanded our insurance coverage to ensure additional financial support for hospital stays.

Environment

Within this chapter:

Environmental stewardship

Part of the non-financial report

Our business operations impact the environment, generating greenhouse gas emissions, wastewater and waste. In addition, we also make use of use materials that can adversely affect ecosystems if not handled properly. Across all our production sites, we meet a strict set of environmental regulations and continually adapt our processes to new regulatory requirements. With natural resources growing ever scarcer, we aim to utilize energy, water and materials as efficiently as possible.

Our approach to environmental stewardship

Minimizing negative environmental impacts and taking meaningful climate action requires a holistic approach while also constantly monitoring practices and performance. We do our best to prevent detrimental emissions into the air, water and soil. Our production sites are located in established industrial and commercial zones. Before acquiring a company – and thus its facilities – we first conduct an environmental risk assessment, taking into consideration information from publicly accessible sources such as local neighbors and non-governmental organizations (NGOs).

How we structure environmental stewardship

The Vice Chair of the Executive Board and Deputy CEO is responsible for environmental stewardship, which also covers climate action, water management, waste and recycling, biodiversity, and plant and process safety. Her duties include the approval of overarching Group-wide guidelines such as our EHS Policy.

Our Group Environment, Health, Safety, Security, Quality (EQ) function oversees all related efforts Group-wide. EQ senior leadership approves operational standards and regularly reports on environmental sustainability to the Executive Board. Once a year, EQ prepares an environment, health and safety report for the Executive Board that covers topics such as climate action, water management, waste and recycling, and plant and process safety. The Executive Board uses this report to steer the strategic direction and as documentation for our ISO 14001 certifications.

At our individual sites, each site director is responsible for environmental stewardship as well as occupational health and safety at the operational level. At larger facilities, the site directors receive support from EHS managers, with EHS coordinators performing this role at smaller sites. These local EHS units report to the respective business sector and work in close collaboration with EQ. In 2020, we employed **more than 200 EHS managers**, supported at the local level by further staff members.

Within our business sectors, the Operations Leadership Committee (OLC) makes strategic decisions on issues pertaining to emissions and energy, water and waste. This body consists of representatives from Healthcare, Life Science, Performance Materials, and our Group EQ function. Decisions made by the OLC and any resulting actions are implemented by the respective business sector. Once per quarter, the OLC members update their leaders on matters relating to environmental sustainability.

Whenever designing new sites or plants, we always involve EQ, which is responsible for reviewing the ecological aspects of a project and advising our sites. Additionally, EQ performs detailed environmental impact assessments for large-scale projects.

Our commitment: Standards and standard operating procedures

Our approach to environmental management is built on our **Group EHS (Environment, Health and Safety) Policy**, which has been approved by our Executive Board. Closely aligned with the requirements of the chemical industry's Responsible Care® Global Charter and the ISO 14001 environmental management standard, this policy underscores our leaders' responsibility for environmental stewardship, health and safety. It is also aimed at our suppliers, calling on them to likewise adopt higher standards of environmental sustainability and safety. Our EHS Policy thus complements the Responsible Sourcing Principles of our Group Procurement function.

Internal guidelines, standards and standard operating procedures define how we put the principles of our EHS Policy into practice, **structure our environmental stewardship efforts and implement occupational safety Group-wide**. In addition, we also have in place a number of other internal environmental sustainability standards such as our Air Emissions Standard, Waste Management Standard, sustainable water management standards, and Energy Management Standard.

Potential EHS risks posed by acquisitions, divestments or site closures are assessed within the scope of due diligence, a process outlined in our EHS Due Diligence and Post Merger Transaction Standard. We prioritize new sites when performing audits.

Material investments in environmental impact mitigation

Efforts to prevent and monitor air, water and soil emissions entail significant expense on our part, as does proper waste disposal. Moreover, we set up provisions for **groundwater and soil remediation** to ensure that we can execute all the necessary measures. As of December 31, 2020, our provisions for environmental protection totaled € 148 million,

95% of which was attributable to Merck KGaA, Darmstadt, Germany.

Assessing environmental impacts

In general, we conduct risk-based assessments along with **internal and external audits** on all our production facilities every three years with the goal of analyzing and minimizing our environmental footprint. Conducted by our Group EQ function, these assessments serve to ensure that our requirements are being met, with appropriate corrective measures being taken as needed. In our Group EHS audits, we assess our sites' performance on a five-tier scale (excellent, good, satisfactory, poor, and critical), which in turn determines how frequently audits are conducted. If the findings are deemed to be good, we audit the facility less often, while significant violations can increase the frequency. Because of the travel restrictions during the Covid-19 pandemic, we could not conduct the majority of the audits scheduled for 2020 and therefore postponed them to 2021. It was, however, possible to perform audits either virtually or on site in ten cases. All audited sites received a good or satisfactory rating, and no site was rated as critical.

Reporting incidents and violations

To review critical situations, near misses and environmental incidents as quickly as possible and take countermeasures, we have a set of **reporting procedures** in place that allow us to track the respective incident, its degree of severity and all risk mitigation efforts. We record all incidents Group-wide and report them to the Executive Board on an annual basis.

In the event of a major occurrence, our digital **Rapid Incident Report System** (RIRS) promptly notifies the Executive Board as well as our Group EQ and Communications functions. Major incidents could include fatalities, accidents with multiple casualties, incidents that impact neighboring communities, or natural disasters such as earthquakes and flooding. Through the RIRS, we can quickly coordinate with all those involved and inform the impacted sites immediately of the respective event. Apart from using this system to identify issues, we also encourage employees to report potential breaches of our standards to Group Compliance. In 2020, we recorded no significant violations of environmental laws or regulations Group-wide.

Environmental training and continuing education

All new EHS managers are required to complete EHStart-up!, a three-day orientation held at our global headquarters in Darmstadt. This seminar covers energy efficiency and climate action, water management, occupational health and safety, and plant and process safety, along with our Rapid Incident Report System (RIRS). In 2020, the Covid-19 pandemic prompted us to offer this onboarding as a series of topic-specific webinars. We recorded these classes so that they are accessible on our intranet any time. Beyond this training, all EHS managers also regularly participate in virtual and in-person courses on new requirements and regulations.

ISO 14001:2015 Group certificate

Since 2009, our company has held an ISO 14001 Group certificate that requires all production sites with more than 50 employees to implement an **environmental management system with predefined indicators** for factors such as greenhouse gas emissions and water consumption. Other sites are not obligated to undergo this certification. The annual internal audit reports and management reviews carried out under the Group certi

92

of our sites worldwide are currently covered by our ISO 14001 certificate.

Every year we contract a third party to perform a certification audit. In 2020, a random sampling of 13 sites underwent an audit for our Group certificate, with all audited facilities passing. Beyond undergoing external inspections, we also conduct internal audits to ensure Group-wide compliance with our requirements.

Biodiversity at our sites*

Unsealed surfaces represent an important habitat for plants and animals. At our facilities, however, we are required to seal certain surfaces to minimize the risk of chemicals entering the ecosystem. When safety requirements permit, we increase the number of surfaces that are unsealed. The next species conservation assessment of our Darmstadt site is scheduled for 2021 and will document the species present along with the protected nesting areas and refuges located on our premises. The last species conservation assessment was conducted in 2015.

* The paragraph on Biodiversity has been assigned to the chapter on Environmental Stewardship for thematic reasons. Since Biodiversity does not correspond to the criteria of double materiality, this paragraph is not part of the non-financial report.

climate action

Part of the non-financial report

Climate change is one of the major challenges facing us in the 21st century. Because our company is no exception when it comes to generating greenhouse gases, we aim to reduce these emissions in order to mitigate our impact on the climate. This issue matters not only to us, but also to our customers and many other stakeholders. Changes in the climate can lead to planning and investment uncertainty. Regulations and legal requirements are also evolving in a bid to encourage climate-friendly behavior. We believe that climate action and energy efficiency will pay off in the long run, benefiting both the environment and our business.

Our contribution to climate action

We are taking action to mitigate our impact on the climate. In 2009, we set out to reduce our direct (Scope 1) and indirect (Scope 2) greenhouse gas emissions by a total of 20% by the end of 2020 (2006 baseline), a goal that we achieved on schedule.

In 2020, we therefore drew up new objectives. **By 2030**, we intend to **lower our direct (Scope 1) and indirect (Scope 2) emissions by 50%** (2020 baseline), to be achieved by executing energy efficiency measures, reducing process-related emissions, and purchasing more electricity from renewable sources. We are also aiming to **cover 80% of our electricity consumption with renewables** by 2030. Moreover, we plan to set a new reduction target for our emissions from the upstream and downstream value chain (Scope 3). We are currently setting up processes to record non-reported Scope 3 data more precisely. We will validate the data basis for a specific target in 2021.

By 2040, we intend to achieve **net zero carbon operations** along our entire value chain. This target covers our Scope 1, 2 and 3 greenhouse gas emissions.

How we structure our climate action

Our Group Environment, Health, Safety, Security, Quality (EQ) function is responsible for overseeing climate action within our company, with our individual sites worldwide implementing the necessary measures at the local level. Further information can be found under Environmental stewardship.

Our commitment: Standards and legal frameworks

Two of our EHS standards, "Energy Management" and "Emissions of Refrigerants", enable energy and process-related emissions to be managed consistently across the Group. We utilize an internal audit process to check compliance with all EHS standards on a random basis.

In addition to our own standards, we are subject to a wide array of **national and international energy and climate regulations**. At the European level, for instance, we are required to comply with the EU Energy Efficiency Directive 2012/27/EU, which stipulates that companies must conduct regular energy audits or implement an ISO 50001-certified energy management system. The sites subject to these requirements are responsible for taking the requisite actions and furthermore undergo audits conducted by internal and external experts. In total, 13 sites have been certified to ISO 50001.

Our co-generation plant in Darmstadt and heating plant in Gernsheim (both in Germany) have made it necessary for us to participate in EU emissions trading since 2005. The EU's 2030 climate and energy framework is designed to achieve the objectives of the 2015 Paris Agreement, with **EU emissions trading** playing a key role in reaching the greenhouse gas emissions reduction targets. The amended EU Emissions Trading Directive (2003/87/EC) took effect in April 2018, thereby updating the legal framework for the fourth phase of the EU emissions trading program (2021 – 2030) and tightening the rules for free CO_2 allowances. Going forward, we will therefore increasingly have to purchase emission allowances.

The German Fuel Emissions Trading Act (BEHG) stipulates the introduction of a **national carbon pricing system for fuel** in Germany starting in 2021. We therefore expect the cost of fossil fuels to increase.

Slight rise in energy consumption

We consumed 2,372 gigawatt hours of energy in 2020, versus 2,178 gigawatt hours in 2019. Our energy intensity relative to sales totaled 0.14 kilowatt hours per euro in 2020.

Our emissions

In 2020, we integrated Versum Materials, which we acquired in October 2019, into our reporting. Because Versum Materials has no data that dates back to 2006, we could not reflect these additional emissions in our 2020 climate action target.

We **lowered** the greenhouse gas emissions of our legacy business (excluding Versum) **by roughly 25%** from our 2006 baseline, thus achieving our overall reduction goal despite growth in our operating business.

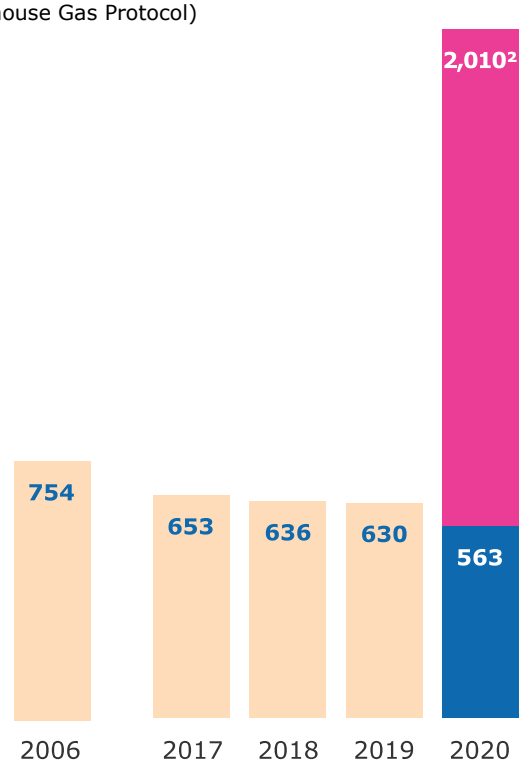
The integration of Versum Materials caused our greenhouse gas emissions to rise sharply. In 2020, we emitted aproximately 2,010,000 metric tons of CO_2 equivalents (CO_2eq) (2019: 630,000). Our direct emissions (Scope 1) totaled 1,706,000 metric tons of CO_2eq, with indirect emis-

sions (Scope 2) of roughly 304,000 metric tons calculated according to the market-based method (2,101,000 metric tons according to the location-based method which does not specifically take renewable energy sources into account). Greenhouse gas emission intensity (Scope 1 and 2) amounted to 0.11 kg of CO_2eq per euro of net sales in this period.

In 2020, we focused on creating more **transparency** on our **Scope 3 emissions**. Going forward, we will be including all Scope 3 categories in our reporting.

Greenhouse gas emissions, Scope 1 & 2 (metric kilotons)[1]

(Scope 1 and Scope 2 of the Greenhouse Gas Protocol)



[1] In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline), greenhouse gas emissions have been calculated based on the current Group structure in the fiscal year and retroactively adjusted for acquisitions and divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted).

[2] Emissions including Versum materials. In blue:emissions excluding Versum materials.

Transparency on CO_2 emissions and energy consumption

Since 2008, we have been reporting to the CDP on an annual basis. This organization assesses the ways in which companies are working to lower greenhouse gas emissions and minimize the risks and consequences of climate change, along with their success and strategy for doing so. Companies are rated from A to D-, with A being the top score. We improved to a B in 2020 (2019: C).

Climate action

In 2020, our emissions reduction efforts focused on **purchasing electricity generated from renewable energy sources**. In 2020, we sourced 27% of our purchased electricity from renewables (2019: 19%). Renewables represented 12% of our total energy consumption.

Driving energy efficiency in Darmstadt

In 2020, a variety of **energy efficiency initiatives** helped us save around 1,700 metric tons of CO_2eq at our global headquarters in Darmstadt. For instance, we updated heating, ventilation and air conditioning systems, implemented energy-saving lighting concepts and optimized cooling lines.

Reducing process-related emissions

Several of our production lines record high levels of process-related emissions. In our Life Science business sector, this is first and foremost caused by the release of perfluorinated carbons (PFCs). In 2020, our Jaffrey plant (New Hampshire, USA) replaced two emission-heavy production lines with equipment that does not emit PFC. Thus, a total of **four out of 14 production lines** at the site now operate **PFC-free**. As a result, we anticipate a 28% reduction from existing PFC emissions in 2021 compared to 2020. Furthermore, four additional PFC-free production lines are ready to be placed into service in 2021. Two of these are new assets built for increased production capacity.

With Versum Materials now integrated into our Performance Materials business sector, our process-related emissions have risen sharply. A large percentage of these emissions arises from the production of specialty chemicals

for the electronics industry. We are currently looking into ways to lower these emissions.

Switching to sea freight

In an effort to lower greenhouse gas emissions resulting from the transport of our products, we **use sea freight** rather than air shipping whenever possible. To this end, in 2019 our Healthcare business sector launched the transformation program "Spezzatino". One of its objectives is to transport less than 10% of our Healthcare products by air by 2023, converting a majority of transport lanes to sea freight. This will lower our annual CO_2 emissions by 10,000 metric tons. Between 2019 and 2020, we achieved a reduction of 5,000 metric tons.

Green mobility

In recent years, we have significantly lowered the average CO_2 emissions of our company car fleet. Nevertheless, we did not achieve the 30% reduction in these emissions by the end of 2020 as originally planned (2013 baseline). In 2020, we drafted a new Group-wide guideline and an action plan aimed at making our fleet more eco-friendly. These will both take effect in 2021. Our objective is to transition most of the vehicles in our car fleet to lower emission engines by 2025, enabling us to reduce the total emissions of our vehicles by 25% compared to 2020. This would equal approximately 733 metric tons of CO_2. In this endeavor, we are basing our calculations and measurements on the **worldwide harmonized light vehicle test procedure** (WLTP).

The average emission rate of our company car fleet in Darmstadt and Gernsheim (both Germany) is currently 111 g/km. The fleet features 26 electric and hybrid cars, representing a share of 16%. To facilitate this shift, we have installed an extensive charging infrastructure at our global headquarters, part of which is available to our employees for their own personal use. In addition, we also provide charging stations for company and personal vehicles at sites in France, India, Ireland, Switzerland, the United Kingdom, and the United States.

Employee incentives

We encourage our employees to play their part in preserving the climate. Aside from regularly reporting on **our Group-wide climate actions** in our EHS newsletter, we also provide helpful information and tips on our intranet. Moreover, we support employees who are seeking greener modes of transportation.

- At our German subsidiaries, we offer a subsidy of € 100 towards monthly lease payments to employees who opt for a **greener company car model**.
- Our workforce in Darmstadt also has access to a **"Jobticket", an annual public transit pass** whose cost is partially covered by our company. Additionally, we also make available an online tool that helps our people arrange carpools.
- At our German sites, we also encourage workers to use climate-friendly forms of transportation through "bike4me", a program enabling them to **lease a bike** at discounted rates with payments coming out of their pre-tax income. Furthermore, employees throughout Germany can also take advantage of the Call a Bike service offered by Deutsche Bahn (the German railway company). This gives them access to a shared bike that is free of charge for the first half hour and can be borrowed and/or returned in the immediate vicinity of our sites.
- In the United States, we also offer our workforce financial incentives to choose a more sustainable lifestyle. For example, employees can receive up to US$ 1,000 in subsidies towards the installation of solar power on their home and up to US$ 100 towards the cost of an energy audit. They are also eligible for as much as US$ 3,500 towards the purchase of a hybrid or electric vehicle that has been designated as "SmartWay Elite" by the U.S. Environmental Protection Agency.

waste and recycling

Although waste contains valuable raw materials that can be reused in the production stream, it can also pose a wide range of risks to the environment. We therefore consider it essential to either prevent waste, or to reuse and recycle as much of it as possible.

Our approach to waste and recycling

We aim to both limit the loss of raw materials and reduce the impact of our waste disposal practices on ecosystems. To this end, we are working to lower our Waste Score, our key waste management indicator, by 5% by 2025 (2016 baseline).

We prevent the generation of waste by, for instance, developing new production processes or optimizing existing ones. When this is not feasible, we do our best to recover materials or energy from the waste we create. Our waste scoring system helps us support a circular economy. Waste separation makes it possible to **recover and recycle raw materials**, while unrecyclable waste is disposed of in an environmentally sustainable manner in line with the strictest waste disposal standards. In doing so, we comply with local legal regulations and take into account the available disposal options.

Responsibility for the waste disposal process

As a company that generates waste, we are responsible for the ultimate disposal of our waste products and therefore choose our service providers with the utmost care, contractually stipulating disposal requirements. We conduct random audits to verify their **compliance with our disposal standards**, especially when it comes to hazardous waste.

How we organize our waste management and recycling

Our Group Environment, Health, Safety, Security, Quality (EQ) function bears overall responsibility for our waste management and recycling practices, while our EHS managers are in charge of implementing our requirements at our individual sites. We have a Group-wide committee consisting of experts from EQ and our business sectors to coordinate our approach to waste management.

Waste management forms part of our Group-wide environmental management system, with 92 sites certified to ISO 14001. In addition to undergoing external certification, we also conduct internal EHS audits to review our waste management practices. Moreover, we regularly host activities such as EHS forums and conferences to keep our local EHS managers and site directors up to date on the topic and raise awareness. In 2020, we resorted to virtual training due to the global restrictions resulting from the Covid-19 pandemic.

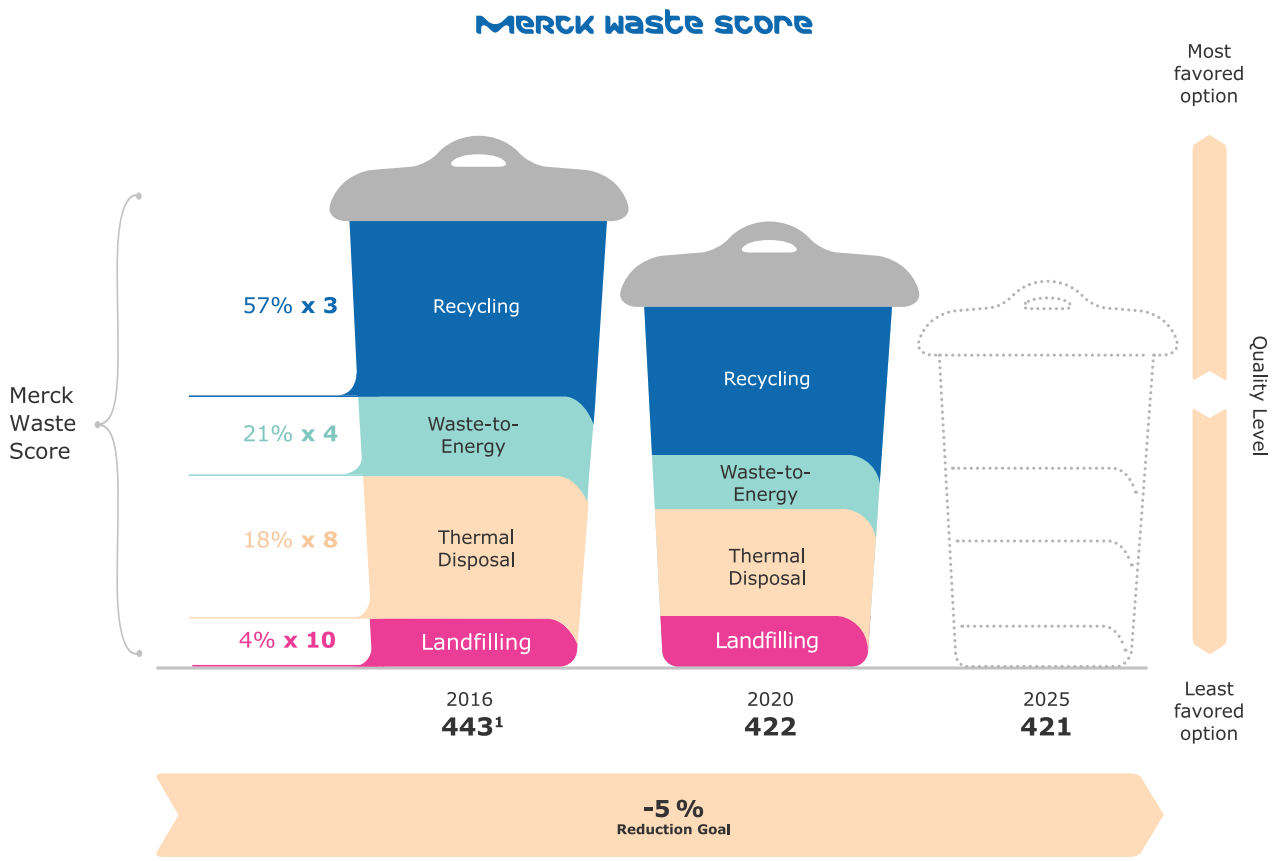
Further information can be found under Environmental stewardship.

Our commitment: Group-wide EHS standards

Our Group-wide EHS Waste Management Standard provides a **consistent framework for waste management across all our sites**, defining organizational structures and minimum requirements. This standard also stipulates that all facilities document their waste by type and quantity and report this data to our Group EQ function.

Systematic waste reduction

We use a variety of methods for recycling, recovering and disposing of the waste we generate, each of which has a different impact on the environment. To systematically account for these effects, we have put in place a waste scoring system that allows us to compare the amount of waste our individual sites generate and track our various waste streams. Under this system, our waste streams are broken down into five categories by percentage: landfilling, thermal disposal, waste-to-energy, recycling, and prevention. This percentage is then multiplied by a factor that increases based on the disposal method's environmental impact. The total from each category is added together to yield our total Waste Score. Prevented waste is multiplied by a factor of zero, thus lowering the overall score.



[1)] The baseline was retroactively adjusted owing to subsequent data corrections.

Reducing the environmental impacts of waste

To systematically account for the environmental footprint of our waste, we have put in place the Merck Waste Score. We are aiming to reduce this score by 5% by 2025 compared with 2016. To achieve this goal, we constantly examine our production processes and disposal methods to identify potential areas for improvement, an endeavor supported by the EHS units of the business sectors at each respective site. They regularly discuss best practices, share lessons learned across our sites, and drive the transition to greener disposal methods. In 2020, we succeeded in reducing our total Waste Score by 4,6% relative to 2016.

Year on year, the amount of waste we generated in 2020 decreased slightly, totaling 231 metric kilotons (2019: 244 metric kilotons). Soil, construction and demolition waste accounted for 21% of our total waste in 2020 (2019: 31%). Our Waste Score does not factor in this type of waste, which can rarely be avoided and must be discarded in accordance with clearly prescribed methods.

Promoting the circular economy

Under the ProMec initiative at our Darmstadt site, we are promoting a **sustainable, resource-efficient circular economy.** We are refining our solvent recycling practices, thereby minimizing the adverse environmental impacts from the disposal of our production waste. In 2020, we expanded our solvent recycling program to include a variety of solvents from Organics production, which has allowed us to recycle an additional 600 metric tons of solvent. This move has sustainably boosted the recycling rate of our production waste in Darmstadt from 8% to 16%.

Shifting from landfill to waste-to-energy

In mid-2020, our St. Louis (Missouri, USA) hub shifted a large portion of its **waste disposal from landfill to waste-to-energy recovery**. By the end of 2020, more than 140 metric tons of waste had been sent to waste-to-energy plants. In 2021, we expect 330 metric tons at a minimum to be processed via this disposal channel, which has an 89% lower CO_2 emission rate than landfill. Avoiding landfill will help us reduce our emissions from waste at St. Louis by 120 metric tons of CO_2 per year. In 2021, the site is planning to shift further waste streams from landfill to waste-to-energy recovery.

water management

Water scarcity is affecting more and more regions worldwide. Because we too depend on the availability of water, our environmental stewardship efforts focus heavily on sustainable water management. In addition, our wastewater may contain trace substances such as heavy metals or active pharmaceutical ingredients. Our water management practices and processes comply with all applicable water protection laws and are immediately adapted to tightened regulations.

Our approach to sustainable water management

To us, sustainable water management means obtaining freshwater or discharging treated wastewater without negatively impacting aquatic ecosystems.

To promote sustainable, efficient water management practices, we avail ourselves of the European Chemical Industry Council (Cefic) assessment tool. Our sites used this tool to evaluate their water management, drew up action plans and implemented them stepwise by the end of 2020.

We are also concerned with addressing water scarcity. To help us determine whether a site is located in a water-stressed area, we utilize tools such the Aqueduct Water Risk Atlas of the World Resources Institute (WRI). A water-stressed area is created when the water withdrawn exceeds the amount of water renewed.

We systematically analyze our water withdrawal data and set clear reduction targets. Our previous goal aimed to **lower our water consumption at sites in water-stressed areas by 10% by 2020 (2014 baseline)**, which we had achieved by the end of 2020.

We have therefore defined new targets to be achieved by 2025 and 2030 (see "Using water more efficiently" and "Our wastewater"). We wish to curb the environmental impacts of our wastewater and make our processes more efficient when it comes to water use. Going forward, we will also be taking into account water-related risks that are associated with key raw materials in our supply chain. In the long term, we intend to transparently map out the water use and environmental impacts throughout the entire life cycle of our products.

Our regular EHS audits at our production and development facilities also review **site-specific water management practices**.

Our water management efforts focus more heavily on our manufacturing sites than our administrative facilities because they have a greater potential for impacting local aquatic ecosystems.

How we approach water management

Our Group Environment, Health, Safety, Security, Quality (EQ) function bears overall responsibility for water management. At our sites, engineers work in close collaboration with our EHS managers to lower water consumption and treat wastewater.

Further information can be found under Environmental stewardship.

Our commitment: Standards and procedures

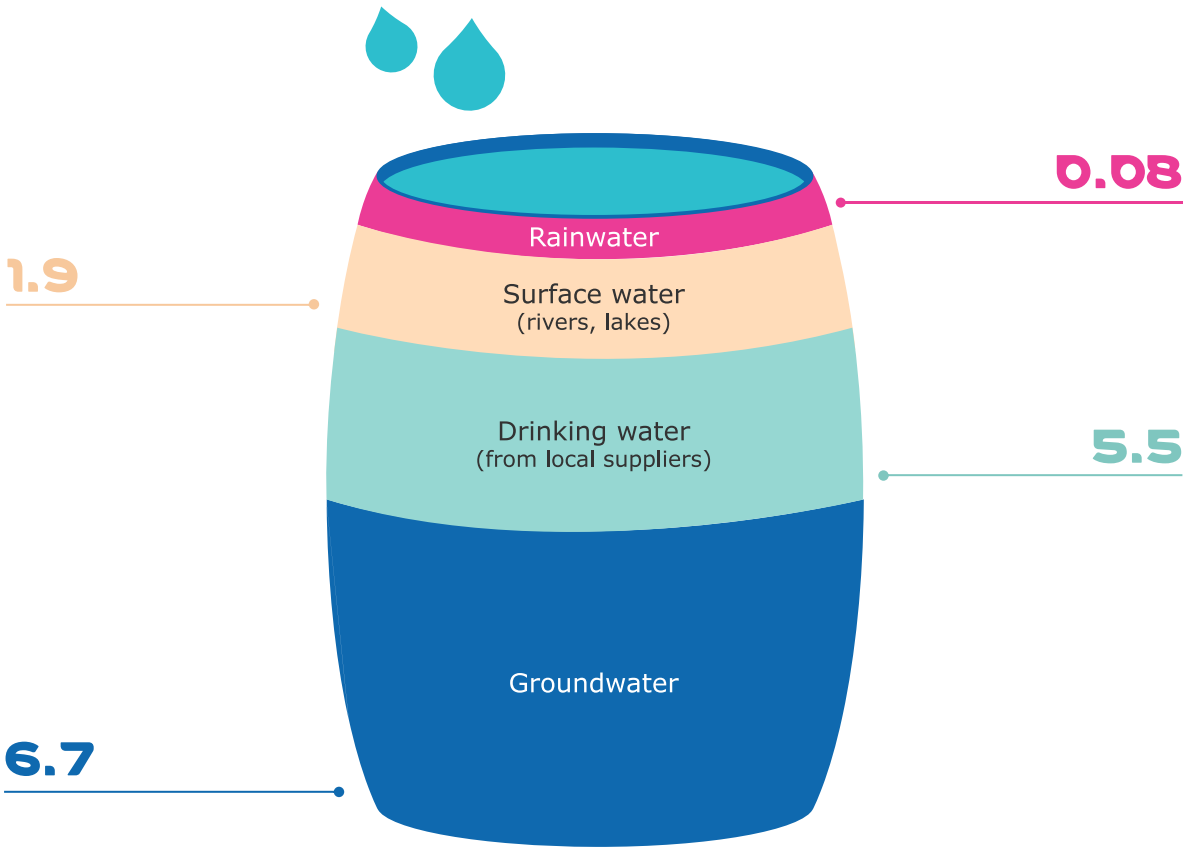
Our Group-wide "Sustainable Water Management Part 1 – Wastewater" and "Sustainable Water Management Part 2 – Water use and stormwater protection" standards detail the way we integrate **state-of-the-art mechanisms for sustainable water stewardship** into our management system. Both are based on the commitments we have made under the global Responsible Care® initiative.

Our "Wastewater" standard defines criteria for assessing our wastewater discharges into the ecosystem, while "Water use and stormwater protection" sets out Group-wide requirements for the responsible consumption of water as a resource. In addition, it establishes a way for us to manage the risks that arise from direct or indirect water extraction and also covers risks such as contaminated rainwater and flooding. We perform internal EHS audits to verify that our sites comply with these standards. All our sites are required to measure and assess the risks and impacts of the hazardous substances in their wastewater and to analyze water withdrawal and rainwater risks. They must also comply with the respective requirements imposed by local authorities.

Water withdrawn from our own sources

For the most part, we draw water used for our production processes from our own wells and source drinking water from local suppliers. We never do anything to compromise sensitive water sources. Nevertheless, we keep an eye on trends that could potentially lead to sources being reclassified as sensitive.

Water withdrawals (millions of m^3) – 2020



The cooling water used for our production processes generally runs in a circular system. Depending on regulatory standards and the energy footprint, we sometimes use freshwater for cooling in a once-through system. For certain applications, we treat production wastewater and reuse it. In 2020, we recycled a total of 22 million cubic meters of water.

Using water more efficiently

We seek to minimize our impact on the water situation in the vicinity of our sites. In 2020, we withdrew 14.2 cubic meters of water in total, with 700,000 cubic meters originating in water-stressed areas. This figure includes our manufacturing facilities in Mexico City (Mexico), Mollet del Vallès (Spain), Kankakee (Illinois, USA), Norwood (Ohio, USA), Savannah (Georgia, USA), and Hsinchu and Taoyuan (both in Taiwan). These seven sites must both **transparently report their water use** and identify the process steps that require a particularly high volume of water. Building on this information, we are drawing up action plans to help these facilities lower their water consumption. At our Taiwan sites, for instance, we utilize process wastewater for heating and cooling and also collect rainwater.

Our goal for 2020 was a 10% reduction in annual water consumption in water-stressed areas (2014 baseline). By the end of 2020, the respective sites had cut down their water withdrawals by roughly 27% versus 2014, which means that we actually exceeded our target.

New goal for 2025

Local conditions determine whether a sufficient supply of water is available. In our water conservation efforts, we are particularly concerned with sites in water-scarce areas. To boost our water efficiency, we have therefore created the "Merck Water Intensity Score" that reflects the amount of water withdrawn at a given site relative to the local availability of water and the number of man-hours worked. We have committed to improving this indicator by 10% by 2025 (2019 baseline). In calculating our Water Intensity Score, we factor in the local water stress levels as mapped out in the Aqueduct Water Risk Atlas of the World Resources Institute (WRI).

Our wastewater

In 2020, we generated 13.4 million cubic meters of wastewater. This consisted of around 9.2 million cubic meters of freshwater, which was directly discharged into

surface waters, and 4.2 million cubic meters of other water, which was treated at external treatment plants or disposed of in an ecologically sustainable manner. When directly discharging wastewater into aquatic ecosystems, we comply with all legal requirements. Before we obtain a discharge permit, the local authorities review the profile of the local aquatic ecosystems to ensure that they will not be compromised by our activities. Approximately 50% of our total wastewater was discharged by three of our sites. Our Gernsheim site in Germany discharges its treated wastewater into the Rhine and our Onahama site in Japan into the Pacific Ocean. The wastewater generated at our Darmstadt site in Germany is treated in our own treatment plants before being released into the Schwarzbach/Ried Creek, a tributary of the Rhine River. The volume of treated wastewater we discharge represents approximately 4% of the average annual water volume of the Schwarzbach/Ried Creek, which complies with all statutory regulations. We coordinate closely with the respective authorities to address and adapt to the increasingly stringent legal requirements for the discharge of treated wastewater.

Residues in wastewater

We continuously work to optimize our production streams and purification processes in order to conserve water and minimize residues. An expert has been appointed for each of our business sectors to provide guidance for our sites. For our pharmaceutical manufacturing facilities, this pertains in particular to **active pharmaceutical ingredient residues in our wastewater**. All such sites have their own wastewater treatment plants and regularly analyze their wastewater to check for harmful substances.

We also process antibiotic active ingredients on a small scale. In order to prevent adverse effects, the wastewater generated from these activities undergoes an additional purification process before being discharged into the ecosystem, thereby minimizing remaining antibiotic residues.

New goal for 2030

When it comes to discharging wastewater, we strictly adhere to government regulations. However, even though we meet all applicable requirements, slight amounts of trace substances still end up in the environment. Our new target therefore goes beyond the stipulations of legal requirements: By 2030, we plan to reduce potentially harmful residues in our wastewater to **below the no-effect threshold**, a scientifically defined limit below which no negative environmental impacts are to be expected.

Enhancing water treatment quality

In 2020, our new industrial water treatment plant in Jaffrey (New Hampshire, USA) opened its gates. The facility will allow for the reuse of up to 90,000 cubic meters annually. This equals a water reusage rate of 80% and significantly reduces the wastewater loadings to the local municipal treatment works. Additionally, the plant generates energy savings of more than 500,000 kilowatt hours per year due to various process improvements.

Assessing our water management practices

In addition to reporting on our climate action efforts, we also report water-related data to the CDP, which collects environmental data from companies once a year, evaluating their processes and performance on a scale from A to D-. In 2020, we were awarded a "B" for our water management practices (2019: B).

plant and process safety

Part of the non-financial report

The safety of our plants and processes is a key function of our management systems for environmental stewardship and occupational health and safety, allowing us to protect both our employees while on the job as well as the people in the immediate vicinity of our sites. Besides management systems, we also have high-performance safety systems in place to minimize production errors and lower the risk of financial losses.

Our approach to plant and process safety

We seek to **minimize manufacturing process hazards** wherever possible in order to avoid workplace accidents, production outages and chemical spills, which is why we regularly review our approach to plant and process safety. Our EHS performance indicators (see "Keeping a close eye on safety") are utilized to continuously gauge our safety performance and practices. We train our employees regularly in an effort to prevent human error and also to detect technical defects before they can cause harm.

How we organize our plant and process safety

Our Group Environment, Health, Safety, Security, Quality (EQ) function coordinates plant and process safety within our company. At the operational level, this is handled by our individual site directors with support from their local EHS managers/coordinators.

Further information can be found under Environmental stewardship.

Our commitment: Standards and legislation

Setting forth the safety rules for all production plants and warehouses, our Group-wide EHS Plant and Process Safety standard covers the entire life cycle of a plant, from planning and construction to operation, retooling, servicing, and maintenance through to decommissioning. Our EHS Spillage Control standard governs the **handling of hazardous materials** Group-wide and stipulates organizational requirements to prevent toxic substances from spilling or leaking during storage and transport. Our Fire Protection standard provides our sites with a clear framework of fire protection requirements.

Alongside these standards, our Risk Management Process guides all our sites in identifying and assessing risks and is used to devise further measures to minimize them. Our Group Procedure Hazard and Operability Study defines the individuals responsible for pinpointing potential hazards during new plant construction, plant retooling or safety-related plant modifications; it also outlines the manner in which these dangers should be assessed and documented.

Assessing potential risks

Before commissioning a plant, we draft a safety concept that is then subject to continuous review and, when necessary, updated until the facility is decommissioned. This concept contains an overview of potential risks and the corresponding protective measures. After any alterations are made to a plant, we also reassess the hazard and risk situation. At our Darmstadt site, we revised our plant safety concept in 2020 to incorporate the latest recommendations from the German Commission on Process Safety (KAS).

We conduct internal EHS audits (see Environmental stewardship) to verify the safety of our plants and processes. Our sites are required to rectify any deficiencies discovered during the audit, with the auditor then checking whether the specified corrective actions have been taken.

Keeping a close eye on safety

We track EHS performance indicators at all production and warehouse facilities, as well as at major research sites, including both accidents and near misses. We investigate each individual incident and then devise appropriate countermeasures in an effort to reduce the likelihood of such events reoccurring in the future. EHS performance indicator data are reported once a month within each business sector, with the Executive Board receiving reports on the topic once a year. **Five indicators** are particularly important to us here:

- Under our EHS Incident Rate (EHS IR, see below), we track and evaluate all major and minor accidents and incidents.
- The EHS IR also includes our Loss of Primary Containment (LoPC) indicator.
- Also important is the EHS Leading Rate (EHS LR), which is calculated based on an analysis of near misses and critical situations. Some of our individual business sectors have also defined their own annual targets for EHS IR and EHS LR.
- In the United States, we additionally use the Occupational Illness Rate (OIR) to track work-related illnesses and their long-term effects.
- Our goal was to stabilize our Lost Time Injury Rate (LTIR) – the number of accidents Group-wide resulting in at least one missed day of work per million man-hours) at 1.5 Group-wide by 2020. We exceeded our objective, having achieved an LTIR of 1,3 in 2020.

EHS Incident Rate

To document accidents and other incidents, we track the EHS Incident Rate (EHS IR), an indicator that covers the following four types of data:

- The number of workplace accidents involving our employees and the contractors who work at our sites
- Environmentally relevant incidents as defined by the European Chemical Industry Council (Cefic) and the German Chemical Industry Association (VCI), for instance product spills
- The activation of operational safety precautions with no adverse impact on people or the environment, such as preemptive systems shutdowns
- Deviations identified during third-party reviews and audits conducted by regulatory agencies and/or our certifiers

The calculation of the EHS Incident Rate includes the number of incidents and the severity of the event relative to the number of man-hours worked. The lower the EHS Incident Rate, the safer the site is.

3.4

Our EHS IR was 3.4 in 2020, representing a slight decrease compared to 2019 (3.6).

In 2020, we recorded no significant incident-related spills across any of our production, research and warehouse sites Group-wide.

Training and sharing lessons learned

The safety of our plants and processes is predicated on the smooth interplay of man and machine. We provide our employees with regular plant and process safety training and offer internal continuing education to site, production, engineering, and EHS leaders. Likewise, we train all newly hired EHS managers on plant and process safety (see Environmental stewardship) during their EHStart-up! onboarding.

In the interest of improving safety, it is extremely important to continuously **share best practices and lessons learned**. This approach enables all our production sites to learn from incidents at other facilities and take preventive measures. Once a month, for instance, site directors and EHS managers participate in safety leadership calls to share new lessons learned. Additionally, our site EHS managers regularly hold discussion sessions to benefit from each other's experiences.

Transparent communication

In line with the stipulations of the German Hazardous Incident Ordinance, our **safety reports** are fully accessible to the public upon request. At our Darmstadt site, we hold **neighborhood meetings** to inform people about potential hazards and protective measures in the event of a hazardous incident. Further information can be found in our accompanying Incident Brochure, which we update every three years and send to approximately 17,000 households in the vicinity of our global headquarters. This document is also available on our website.

community

Within this chapter:

community engagement

We see ourselves as part of society – both at our individual sites as well as worldwide. Our aspiration is to help shape society. We do this both through our products and technologies and through our community engagement. That is why we work with our employees to promote a diverse array of social initiatives that help tackle challenges at the local level.

Our approach to community engagement

Worldwide, we are deeply committed to supporting the communities in which our sites are located. We focus on health, education and culture as well as environmental stewardship. Moreover, we provide disaster relief and offer support to people in need in the vicinity of our sites.

We are particularly determined to **facilitate access to health** for people worldwide. We do this by getting involved in numerous healthcare projects. In doing so, we specifically contribute our experience in all aspects of healthcare.

We also promote **science and culture education**. This has a long tradition in our company. As a science and technology company, we champion creativity, the joy of discovery, curiosity and the courage to push boundaries. That is why we award scholarships and literary prizes, for example, or promote practice-oriented curricula.

Protecting the environment and using natural resources responsibly is a task for us all. Therefore, we support various initiatives around the world that help raise **awareness of environmental protection**.

We regularly evaluate the achievement of objectives and the impact of our projects. Our analysis is based on the so-called iooi method (input – output – outcome – impact) of the Bertelsmann Foundation. In the first step, we measure our **input** based on the product or monetary donations made and the time our employees invest in volunteer projects. In the second step, we record the immediate **output**, for example the number of organized training programs that were made possible thanks to our financial donations. We are also interested in the impact we have achieved for the specific target group. Our goal is to ensure that our social commitment continues to have a positive impact on society. For this reason, we are constantly working to make the **impact of our projects (outcome and impact)** for our target groups measurable.

The latter is particularly important to us, which is why we mainly initiate projects that aim to improve specific social situations or solve social problems. Around 72% of our project spending goes towards this. We also support short-term or one-off charitable activities and initiatives that are beneficial to our business (for example, in recruiting staff) and can help the community at the same time.

Together with reliable partners, we support many long-term projects and form **long-term partnerships**. This enables us to strengthen our relationship with our stakeholders and to reinforce our social license to operate.

How we structure community engagement

The Group Corporate Affairs function monitors our Group-wide community outreach and coordinates some of our activities, including the Merck Schistosomiasis Elimination Program, the Global Pharma Health Fund (GPHF), the Embracing Carers initiative as well as the Deutsche Philharmonie Merck. In addition, our business sectors launch their own projects, such as the educational program SPARK™. Our local subsidiaries are responsible for planning and implementing local activities on a decentralized basis. They decide for themselves in which focus areas they want to get involved. We include some of our health initiatives in low- and middle-income countries in the Merck Foundation.

The Merck family of entrepreneurs also has a long history of supporting charitable causes. Their activities are organized via the Merck Family Foundation and the Merck'sche Gesellschaft für Kunst und Wissenschaft (Merck Society for Art and Science). The Merck Family Foundation supports international charitable projects – preferably those in which our employees are privately involved. The Merck Family Foundation is financed entirely from funds provided by the entrepreneurial family. The Merck'sche Gesellschaft für Kunst und Wissenschaft is a charitable association. It supports artistic and scientific projects with a connection to either the Rhine-Main region, the city or the government district of Darmstadt or to our business sectors.

Our commitment: The principles of our community engagement

In designing our projects, we are guided by our Group-wide "Group Policy on Contributions to Society". It defines what community engagement means for our company and what objectives we are pursuing. This policy gives our business sectors and subsidiaries abroad a framework for structuring their respective activities themselves; moreover, it stipulates roles and responsibilities.

Health initiatives are also governed by guidelines from our Healthcare business sector and our Access to Health Charter. We calculate the value of our pharmaceutical donations in accordance with the World Health Organization (WHO) Guidelines for Medicine Donations.

With our Corporate Volunteering Guideline, we want to encourage our people to get involved in supporting the community. We grant our employees up to two days of paid leave per year to take part in volunteer activities either run or supported by our company.

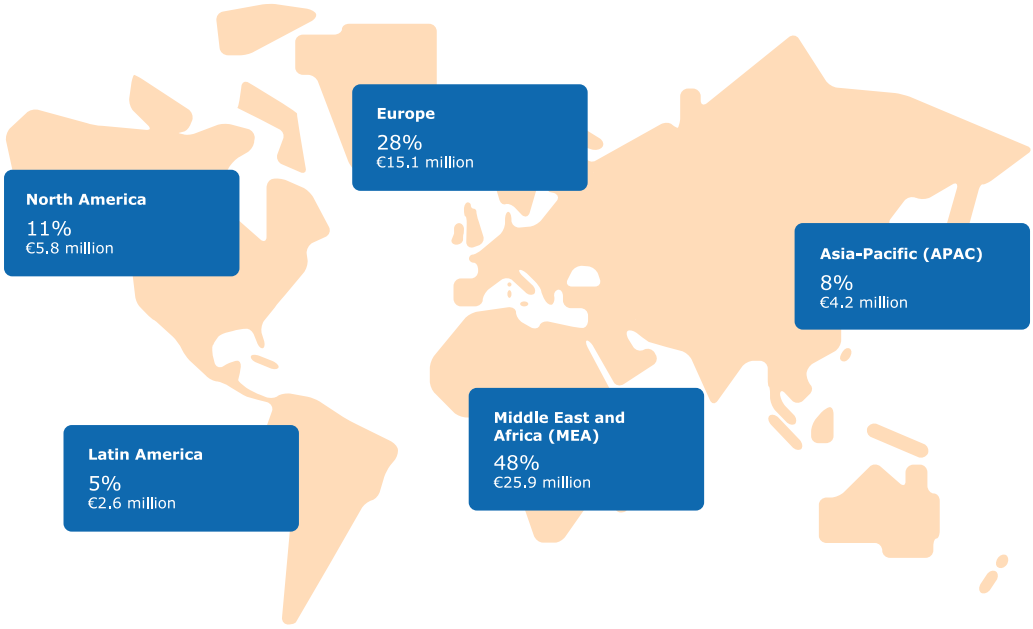
Our Good Deeds

Our community outreach activities are collectively referred to as Our Good Deeds. In 2020, we supported 274 projects in 96 countries in the fields of "Health", "Education and Culture" and "Environment". In addition, we supported people in need in our local communities and provided disaster relief.

Our community engagement activities – 2020

Our projects include **volunteering initiatives as well as monetary and product donations**. In 2020, we spent a total of around € 53,6 million on community outreach. Product and in-kind donations accounted for 55% and cash donations for 43% of this amount. Our employees actively participated in 20% of the projects either through monetary donations or volunteer work. As part of the volunteering projects, around 1,400 employees volunteered around 7,000 hours during their working hours. The amount contributed by the Merck Foundation is not included in this figure. Nor are initiatives that primarily served to market our products.

Community engagement spending by region



Our employees were once again able to choose their favorite project from all our projects in 2020. We awarded the projects with the most votes and provided them with additional financial support.

Supporting health projects

We use our expertise to support health initiatives around the world. In particular, we focus on providing basic and advanced training for health workers, promoting local healthcare infrastructure and educating people on health issues.

We are dedicated to **improving medical care** around the world. We organize medical education programs through our Global Medical Education and Academic Organization Relations departments, either directly or by providing grants to third-party medical education providers. In doing so, we foster advanced medical education programs designed to broaden the scientific knowledge and competence of scientists and healthcare professionals and, ultimately, improve patient outcomes.

In 2020, we digitalized 98% of our medical education programs across selected therapeutic areas in order to continue delivering them despite the Covid-19 pandemic. In particular, we supported more than 92 Continuing Medical Education (CME) programs offered by 16 third party medical education providers and designed 22 new medical education programs. More than 370,000 healthcare professionals participated via e-learning platforms and in-person courses.

The initiatives we launch through our Global Health Institute help to **strengthen local health systems in low- and middle-income countries**. We are working in partnership with the Ministry of Health in Senegal and the Access to Water Foundation to provide innovative clean water platforms to local health centers and communities. Our goal is to improve sanitation and operations of health centers in order to provide appropriate care for patients. Moreover, access to clean water is the basic requirement to protect communities against infectious diseases. The water systems are designed by local engineers together with the local responsible medical and women community leaders from the Matam region to ensure that the platform is ideally adapted to health and social needs while creating local ownership. In doing so, the project applies a social business approach to create sustainability.

We also **recognize scientific breakthroughs in healthcare**. Since 2019, we have awarded the annual Future Insight Prize, which is worth up to € 1 million. The prize recognizes and promotes groundbreaking scientific and technological innovations for the benefit of humanity in the fields of health, nutrition and energy. In 2020, Stephan Sieber received the Future Insight Prize for his scientific research on overcoming antibiotic resistance in the category "Multidrug Resistance Breaker".

More information on our health projects can be found on the Our Good Deeds website.

Promoting cultural and educational projects

Our projects in the field of education help to **improve school and university education**. In a quest to spark young people's interest in science, we hold competitions, recognize special achievements and offer opportunities for hands-on learning.

For example, we support and hold the following STEM competitions: For instance, we have been supporting the "Jugend forscht" competition for more than 35 years as the host of the competition in the German federal state of Hesse. In addition, we support the "Internationale Biologie-Olympiade Hessen", the "Internationale Chemie-Olympiade Hessen und Thüringen", the "Chemie – die stimmt!" competition, the one-week "Erfinderlabor" as well as the

Germany-wide "Tag der Mathematik". Due to the Covid-19 pandemic, the competitions could not take place as usual in 2020. Instead, we carried them out digitally: Together with the Hacker School, we organized a two-day virtual programming workshop for young people. We also combined the "Merck-Abiturpreis" (high school graduation award) with a virtual workshop on Design Thinking – a solution-oriented, creative approach to idea generation.

As part of our global volunteer program SPARK™, employees from our Life Science business sector share their skills and experience with students in order to spark their curiosity in science and inspire them to consider a STEM-related career. As an extension of our flagship Curiosity Labs™ program, we introduced the digital Curiosity Labs™ at Home program in 2020 to reach students remotely amid the Covid-19 pandemic. Curiosity Labs™ at Home includes 20 easy and educational hands-on science experiments that can be completed safely at home with materials typically found around the house. In 2020, the program generated more than 2.7 million video views on social media in 132 countries.

Apart from our educational projects, we also further music and literature. We are convinced that **culture inspires people** – and that inspiration can lead to progress. We also help to **strengthen inclusion and tolerance** by sparking young people's interest in culture.

We support the Deutsche Philharmonie Merck, a professional symphony orchestra established back in 1966. It is an integral part of cultural life in Darmstadt and the immediate region and regularly tours internationally. The Deutsche Philharmonie Merck also promotes young talent: In the annual Orchestra Workshop, up-and-coming musicians work together with the orchestra professionals to develop ambitious **concert programs**. Due to contact restrictions caused by the Covid-19 pandemic, the orchestra workshop was cancelled in 2020. However, two concerts could take place under Covid-19 hygiene regulations. In addition, the Deutsche Philharmonie Merck brought musical joy with small performances in front of nursing homes during the contact restriction phase. Moreover, the orchestra made digital video projects available to the public, including a musical advent calendar. Via social media, these projects generated more than 11 million views.

Like music, literature is an important mediator between cultures. We therefore award five **literary prizes** worldwide: in Germany, Italy, India, Japan, and Russia. We award some annually, others every two years. We thus mainly recognize those authors who build bridges between cultures, as well as between literature and science. The Merck Translator Award ceremony in Russia took place virtually in 2020 because of the constraints imposed due to the pandemic. The Johann Heinrich Merck Prize was also awarded under Covid-19 restrictions.

More information about our cultural and educational projects can be found on our website Our Good Deeds.

Supporting environmental initiatives

We are involved in various environmental initiatives and promote **environmental awareness among our employees** through group activities. Our engagement ranges from joint waste collection and tree planting campaigns to supporting organizations that improve access to clean water in remote areas

More information about our environmental initiatives can be found on our website Our Good Deeds.

Solidarity during the pandemic

The Covid-19 pandemic has posed significant challenges for society. To address the most urgent problems, we supported facilities and healthcare workers in 2020. We donated two million respirators in Germany, France and Brazil, for example, as well as 200,000 liters of disinfectant in Germany. In more than 30 countries, our sites initiated numerous fundraising campaigns, which amounted to several million euros in cash and materials. For example, we equipped frontline healthcare workers with protective gear and enabled disadvantaged people or schoolchildren to participate in education. Our employees donated around € 70,000 for children in need via a specially set up donation platform for the aid organization Save the Children; our company doubled the amount. The total amount of € 140,000 primarily benefited educational projects, for example providing socially disadvantaged families with learning material.

facts & figures

Within this chapter:

report profile

Part of the non-financial report

For us, sustainable entrepreneurship and profitable growth go hand in hand. We can ensure our own future competitiveness only by creating value for society. Our ambition is to leverage science and technology so as to achieve progress for mankind. In this report, we present a comprehensive picture of our understanding of sustainable entrepreneurship.

We have a long-standing history of embracing corporate responsibility, which is also reflected in our reporting practices. We have been detailing our efforts to meet our obligations to society since 1993. This initially took the form of environmental reports, evolving in 2003 into the publication of a Corporate Responsibility Report every two years. Since 2016, we have been publishing a report annually. In 2020, we restructured our Sustainability organization, formulated new, strategic sustainability goals and, as a result, renamed our "Corporate Responsibility Report" to "Sustainability Report".

In this report, we describe the new strategic direction of our sustainable entrepreneurship and the focus areas in which we intend to achieve our sustainability goals.

With transparency as a key goal, we work to keep our stakeholders thoroughly informed about our activities and successes, along with the challenges we face.

With this Sustainability Report for 2020, we meet the legal requirements for a combined, separate non-financial report. The Index to the non-financial report provides an overview of the relevant content.

Moreover, the Sustainability Report also documents the progress we have made in implementing the guidelines of the United Nations Global Compact ("Communication on Progress").

Reporting framework

This report covers fiscal 2020 and pertains to our entire Group, including our 221 subsidiaries in 66 countries. Any deviations from this reporting framework are indicated on a case-by-case basis.

Acquisitions and divestments

In 2019, we acquired Versum Materials, Inc. and Intermolecular, Inc., achieving two milestones in the transformation of our Performance Materials business sector.

We are currently consolidating the methods, objectives, results, and measures relating to our non-financial topics identified as being material. We expect to fully complete this by the end of 2021. The sections of the non-financial report in which the mentioned acquisitions play a significant role reflect the current consolidation measures as of December 2020. We do not list completed integration measures in this report.

In 2020, we sold our allergy business Allergopharma to Dermapharm Holding SE. We completed the divestment on March 31, 2020, subject to the approval of the relevant regulatory authorities and other customary closing conditions. Allergopharma is a leading supplier in the field of allergen-specific immunotherapy of type 1 allergies. Allergopharma products are currently available in 18 markets worldwide. The transaction encompassed the Allergopharma business in Europe and Asia, with the broad portfolio of therapeutic and diagnostic products and the production site in Reinbek near Hamburg (Germany).

Data collection and consolidation systems

In general, the 2020 Sustainability Report provides non-financial indicators that represent the entire Group, including the recently acquired companies Intermolecular, Inc. and Versum Materials, Inc. The Allergopharma business is not included as it was divested in 2020. The majority of the figures we publish reflect the status as of December 31, 2020. If we deviate from these parameters in individual cases, we will indicate this accordingly.

Since 2005, we have been using a Group-wide electronic data collection system to collect environmental and occupational health and safety data, which are tracked locally at our individual sites and approved following review. To maximize the quality of this data, we support the sites in improving their collection processes and their corresponding quality assurance measures. Moreover, our Group Environment, Health, Safety, Security, Quality (EQ) function takes measures, such as internal EHS audits, to review both the processes and the data provided.

We collect environmental performance indicators across all our production sites. We also record these indicators for the warehouse, research and office locations that are relevant in terms of their environmental impact. This report's scope of consolidation therefore covers all Group sites that have relevant impacts on the environment.

All employee master data is continually updated in an SAP database. Some employee data is disclosed only for select sites or countries, which is accordingly indicated in the respective text passages.

We use community data management software to track data pertaining to our community outreach activities.

Determining report content

We align the content of our report with the internationally recognized guidelines of the Global Reporting Initiative (GRI) and the principles of completeness and materiality as well as input from our stakeholders. This report has been prepared in accordance with the GRI standards: Comprehensive option. Furthermore, we have taken into consideration the requirements of the capital market for assessing companies' sustainability performance.

We perform a materiality assessment annually to determine the sustainability topics of relevance to our Group. Experts from our business sectors and relevant Group functions review and validate the findings of this analysis. Moreover, as stipulated by section 289c (2) of the German Commercial Code (HGB), we also check the issues for "double materiality". We have derived the content of this CR report from the results of the materiality assessment, which can be found together with the materiality matrix under Materiality analysis.

Our Executive Board has reviewed and approved this report. The content of the non-financial report has also been reviewed by the Supervisory Board in accordance with section 111 (2) of the German Stock Corporation Act (AktG).

External audit

KPMG AG Wirtschaftsprüfungsgesellschaft has audited the annual financial statements and management report of our company for the fiscal year spanning January 1 to December 31, 2020 and has issued an unqualified opinion.

Furthermore, after undergoing a limited assurance audit, our company has received an independent audit certificate for the following chapters of this Sustainability Report as well as for the non-financial report.

The additional contents provided on both the company's websites as well as external web pages that are linked in this report are not part of the information assured by KPMG.

Contact:

We welcome your feedback and are happy to answer any questions.

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The previous Corporate Responsibility Report was published in April 2020. Our next Sustainability Report is scheduled for publication in April 2022.

indicators

economics

Net sales, operating result (EBIT) and research and development costs, by business sector[1]

€ million	Healthcare	Life Science	Performance Materials	Group
2019				
Net sales	6,714	6,864	2,574	**16,152**
Operating result (EBIT)	1,149	1,280	307	**2,120**
R&D costs[2]	1,666	276	267	**2,268**
2020				
Net sales	6,639	7,515	3,380	17,534
Operating result (EBIT)	1,804	1,599	240	2,985
R&D costs[2]	1,640	313	274	2,288

1 As a non-operating segment, Corporate and Other is not shown here as a separate item, but rather under Segment Reporting in our 2020 Annual Report.

2 Part of the non-financial report

business ethics

Part of the non-financial report

Compliance training

	2017[1]	2018[1]	2019[2,3]	2020 Merck Group[4,5]	2020 thereof Merck KGaA[5]
Total number of persons trained on anti-corruption guidelines[6]	**17,044**	**11,404**	**36,109**	**28,827**	**3,880**
Total number of employees trained on anti-corruption guidelines	**13,345**	**11,155**	**35,673**	**28,805**	**3,877**
% of employees trained on anti-corruption	25	22	63	50	45
by employee category					
Number of Role 2+ employees trained on anti-corruption	7,080	9,257	26,890	27,123	3,848
% of Role 2+ employees trained on anti-corruption	27	36	96	90	93
% of employees below Role 2 trained on anti-corruption	23	7	30	6	1
by region (%)					
Europe	18	19	71	51	45
North America	46	36	59	45	not applicable
Asia-Pacific (APAC)	25	16	47	44	not applicable
Latin America	19	12	62	44	not applicable
Middle East and Africa (MEA)	29	18	80	66	not applicable

1 In 2017 and 2018 the position assessment had not yet been carried out for employees of all Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. In the facts and figures, these employees are included under "employees below Role 2".

2 In 2019, the position assessment had not yet been carried out for employees of Versum Materials as well as of Allergopharma. In the figures, employees whose positions have not been assessed have been allocated to "employees below Role 2".

3 As of 2019, we changed our reporting method. Previously, our reports covered the active workforce who has been trained on a specific subject during a particular year. In 2019, we report on the active, trained workforce in the company, regardless of whether their training has already taken place prior to the reporting year. The possibility of trend forecasts for year-to-year comparisons is therefore limited.

4 In 2020, the position assessment had not yet been carried out for employees of Versum Materials. In the figures, employees whose positions have not been assessed have been allocated to "employees below Role 2".

5 In 2020, we began using our own global learning management tool and therefore now have a different reporting structure. As of 2020, we report on the active workforce that is part of the target group and has completed the training in the reporting year. The possibility of trend forecasts for year-to-year comparisons is therefore limited.

6 Includes contractors, external supervised workers (e.g. temps) and contract partners working on-site who were trained on anti-corruption guidelines (2020: 22).

The (employee) target audience for a specific training is related to the risk level associated with employee positions and Role levels. Target audiences therefore may not include all Group employees and also may vary from training to training.

In order to address the special responsibility held by management personnel, and staff with HR responsibility, trainings on anti-corruption guidelines for these employees are in focus. This applies to all employees rated Role 2+.

Our compliance and anti-corruption principles are communicated to all our business partners who undergo a Business Partner Risk Management (BPRM) process.

Internal audits on corruption and Human Rights Charter

	2017	2018	2019	2020 Merck Group	2020 thereof Merck KGaA[1]
Number of audits relating to corruption	50	54	50	52	26
% of audits relating to corruption	65	69	65	66	33
Number of audits relating to the workplace requirements of our Human Rights Charter	45	46	46	42	20

1 Includes global audits which are conducted at the headquarters in Darmstadt and/or the management of the audited function is reporting into KGaA.

In 2020, during 42 of our audits conducted in 14 countries, we reviewed workplace parameters as per our Human Rights Charter. No violations were identified.

Human rights violations[1]

	2017[2]	2018[2]	2019[2]	2020
Number of reported violations of Social and Labor Standards Policy	-	-	-	108
Number of confirmed Violations of Social and Labor Standards Policy	-	-	-	29
thereof number of incidents of discrimination	-	-	-	2

1 In 2020, we modified our reporting structure for human rights violations. Previously, we reported on such violations in the "Reported compliance violations" table. Since 2020, we report on violations of the Social and Labor Standards Policy, which was drafted and rolled out across the entire Group in 2019.

2 Due to our revised reporting practices, we have decided not to report the data from previous years.

Reported compliance violations

	2017	2018	2019	2020 Merck Group	2020 thereof Merck KGaA
Total number of reported compliance violations					
Number of reported compliance incidents	39	72	75	81	8
Number of confirmed cases	14	19	30	41	3
Confirmed cases by category[1]					
Bribery and corruption	3	3	9	6	0
Violation of cartel laws and fair competition rules	0	1	0	0	0
Fraudulent actions against Merck	1	5	8	11	0
Other violations of the Merck Compliance Principles for the relations with business partners	2	1	4	0	0
Other violations of Merck values, internal guidelines or legal requirements	8	9	9	24	3

1 In 2020, we revised our case categories. The figures from previous years have been retroactively adjusted. You can find detailed information on the revised categories in the comment below the table.

Revisions to the table have resulted in the following changes: The category "Violation of the Human Rights Charter" is now being disclosed in the new "Human rights violations" table. As of 2020, the category "Violation of Data Privacy" will be reported separately in the "Data privacy" table.

The category "Violation of the Merck Pharmaceutical Guidelines" was partially merged with "Bribery and corruption". Going forward, the category "Other violations of values, internal guidelines or legal requirements" will include violations from "Manipulation of business documents" and "Infringements in the areas of finance, accounting and banking", along with violations that used to be reported in part under "Violation of the Merck Pharmaceutical Guidelines" or "Violation of Confidentiality Guidelines".

Data Privacy

	2017	2018	2019[1]	2020 Merck Group	2020 thereof Merck KGaA
Reported violations of Data Privacy Guidelines	-[2]	1	1	3	3
Customer Privacy[3]					
Total number of substantiated complaints received from outside parties	0	0	0	0	0
Total number of complaints from regulatory bodies	0	0	1	0	0
Total number of identified leaks, thefts, or losses of customer data	0	1	1	0	0

1 Since 2019, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.
2 No violations reported to the authorities as the reporting obligation was introduced only in 2018 as part of the EU General Data Protection Regulation.
3 These data only reflect incidents classified as significant.

As of 2020, this table presents the number of reported cases of data privacy violations. In the previous years, we reported data privacy violations in one line combined with violations of confidentiality guidelines in the table entitled "Reported Compliance Violations". For more information, please see the table entitled Reported Compliance Violations.

Legal actions

	2017	2018[1]	2019	2020 Merck Group	2020 thereof Merck KGaA
Total number[2] of legal actions pending or completed (for anti-competitive behavior, violations of anti-trust or violations of monopoly legislation)	**3**	**3**	**3**	**4**	**2**
pending	3	3	3	4	2
completed	0	0	0	0	0

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.
2 As published in the annual reports, the herein listed total number of legal actions refers to the significant legal risks as per the company's definition. The significance of legal risks is based on potential negative effects on projected financial objectives as well as on the probability of occurrence.

For further information please see our annual reports:

- Annual Report 2017, pages 148-150 and pages 252-253, No. 27
- Annual Report 2018, pages 146-148 and pages 247-251, No. 26
- Annual Report 2019, pages 115-117 and pages 231-233, No. 26
- Annual Report 2020, pages 125-127 and pages 252-256, No. 27

Employees

Part of the non-financial report

Total number of employees

As of Dec. 31	2017	2018	2019	2020 Merck Group	2020 thereof Merck KGaA
Total number of employees	**52,941**	**51,749**	**57,071**	**58,127**	**8,578**
Men	30,083	29,006	32,531	33,204	5,814
Women	22,858	22,743	24,540	24,923	2,764

Number of employees by hierarchical level

As of Dec. 31	2017[1]	2018[1]	2019[2]	2020 Merck Group	2020 thereof Merck KGaA
Total employees	**52,941**	**51,749**	**57,071**	**58,127**	**8,578**
Senior management (Role 6+)	197	193	190	193	68
Middle management (Role 4 & 5)	2,927	3,095	3,352	3,637	773
Low management (Role 3)	8,904	9,019	9,499	10,286	2,024
Other employees (below Role 3)	40,913	39,442	44,030	44,011	5,713
% of women (total)	**43**	**44**	**43**	**43**	**32**
thereof in senior management (Role 6+)	30	36	39	42	15
thereof in middle management (Role 4 & 5)	917	1,025	1,146	1,284	228
thereof in low management (Role 3)	3,714	3,795	4,029	4,352	703
thereof other employees (below Role 3)	18,197	17,888	19,326	19,245	1,818
% of men (total)	**57**	**56**	**57**	**57**	**68**
thereof in senior management (Role 6+)	167	157	151	151	53
thereof in middle management (Role 4 & 5)	2,010	2,070	2,206	2,353	545
thereof in low management (Role 3)	5,190	5,224	5,470	5,934	1,321
thereof other employees (below Role 3)	22,716	21,554	24,704	24,766	3,895
by age group					
Up to 29 years old (%)	**15**	**15**	**15**	**15**	**14**
thereof in senior management (Role 6+)	0	0	0	0	0
thereof in middle management (Role 4 & 5)	3	5	8	6	1
thereof in low management (Role 3)	194	211	190	199	64
thereof other employees (below Role 3)	7,479	7,279	8,362	8,365	1,096
30 to 49 years old (%)	**62**	**61**	**60**	**60**	**52**
thereof in senior management (Role 6+)	72	69	69	68	29
thereof in middle management (Role 4 & 5)	1,782	1,829	1,933	2,032	460
thereof in low management (Role 3)	6,308	6,206	6,516	6,926	1,280
thereof other employees (below Role 3)	24,733	23,536	25,859	25,948	2,689
50 years or older (%)	**23**	**24**	**25**	**25**	**34**
thereof in senior management (Role 6+)	125	124	121	125	39
thereof in middle management (Role 4 & 5)	1,142	1,261	1,411	1,599	312
thereof in low management (Role 3)	2,402	2,602	2,793	3,161	680
thereof other employees (below Role 3)	8,701	8,627	9,809	9,698	1,928

1 In 2017 and 2018 the position assessment had not yet been carried out for employees of all Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. In the facts and figures, these employees are included under "other employees (below Role 3)".

2 In 2019, the position assessment had not yet been carried out for employees of Versum Materials as well as of Allergopharma. In the figures, employees whose positions have not been assessed have been allocated to "other employees (below Role 3)".

Average number of employees by functional area[1]

	2017	2018[2]	2019[3]	2020[4]
Group	**52,053**	**53,809**	**53,645**	**57,612**
thereof women	**22,353**	**23,388**	**23,503**	**24,746**
Production	15,571	16,240	16,455	17,624
thereof women	5,059	5,359	5,529	6,043
Logistics/Supply Chain	3,729	4,014	4,109	4,298
thereof women	1,442	1,569	1,626	1,734
Marketing and Sales/Commercials	15,115	15,479	13,970	14,127
thereof women	6,609	6,981	6,608	6,787
Administration	9,286	9,864	10,342	11,342
thereof women	4,798	5,067	5,194	5,499
Research and Development	6,789	7,245	7,561	7,504
thereof women	3,591	3,871	4,053	3,996
Infrastructure and Other	1,564	966	1,208	2,717
thereof women	854	541	493	687

1 The average employee headcount is calculated by adding up all employees at the end of each of the last 13 months, and dividing this total by 13.

2 The average employee headcount for fiscal 2018 incorporates the Consumer Health employees on a pro rata basis up until the end of November 2018 due to the divestment of the Consumer Health business as of December 1, 2018.

3 To calculate the average number of employees in fiscal 2019, the employee headcount of Versum Materials has been included on a pro rata basis as of October 2019 owing to the acquisition. They are allocated to the functional area "Infrastructure and Other".

4 The average employee headcount for fiscal 2020 incorporates the Allergopharma employees on a pro rata basis up until the end of March 2020 due to the divestment of the Allergopharma business as of March 31, 2020.

Number of employees by region

As of Dec. 31	2017	2018	2019	2020 Merck Group	2020 thereof Merck KGaA
Total	**52,941**	**51,749**	**57,071**	**58,127**	**8,578**
Europe	**25,980**	**25,792**	**26,715**	**26,587**	**8,578**
Women	11,627	11,464	11,909	11,743	**2,764**
Women (%)	45	44	45	44	32
Number of employees with temporary contracts	1,279	1,209	1,137	1,105	285
% of employees with temporary contracts	5	5	4	4	3
North America	**10,520**	**10,978**	**12,829**	**13,312**	**0**
Women	4,518	4,742	5,285	5,527	not applicable
Women (%)	43	43	41	42	not applicable
Number of employees with temporary contracts	138	148	158[1]	139	not applicable
% of employees with temporary contracts	1	1	1[1]	1	not applicable
Asia-Pacific (APAC)	**11,294**	**10,486**	**12,728**	**13,518**	**0**
Women	4,298	4,348	5,049	5,425	not applicable
Women (%)	38	41	40	40	not applicable
Number of employees with temporary contracts	2,603	2,846	3,263[1]	3,362	not applicable
% of employees with temporary contracts	23	27	26[1]	25	not applicable
Latin America	**4,050**	**3,340**	**3,433**	**3,387**	**0**
Women	1,896	1,648	1,690	1,630	not applicable
Women (%)	47	49	49	48	not applicable
Number of employees with temporary contracts	40	62	55	67	not applicable
% of employees with temporary contracts	1	2	2	2	not applicable
Middle East and Africa (MEA)	**1,097**	**1,153**	**1,366**	**1,323**	**0**
Women	519	541	607	598	not applicable
Women (%)	47	47	44	45	not applicable
Number of employees with temporary contracts	172	189	182	420	not applicable
% of employees with temporary contracts	16	16	13	32	not applicable

1 Employees whose contract type had not yet been recorded in our database by December 31, 2019 were divided up proportionally between the categories "Employees with permanent contracts" and "Employees with temporary contracts".

Employees by business sector

As of Dec. 31	2017	2018	2019	2020
Healthcare employees	**19,795**	**17,456**	**18,136**	**17,463**
thereof women	9,656	8,884	9,232	8,788
thereof women (%)	49	51	51	50
Life Science employees	**19,607**	**20,667**	**21,934**	**23,196**
thereof women	8,276	8,837	9,487	10,175
thereof women (%)	42	43	43	44
Performance Materials employees	**5,529**	**5,278**	**7,329**	**7,228**
thereof women	1,455	1,411	1,712	1,666
thereof women (%)	26	27	23	23

Employees by contract type

As of Dec. 31	2017	2018	2019	2020
Total employees	**52,941**	**51,749**	**57,071**	**58,127**
Number of employees with permanent contracts	48,709	47,295	52,276[1]	53,034
% of employees with permanent contracts	92	91	92[1]	91
thereof women	20,741	20,545	22,237[1]	22,500
thereof women (%)	43	43	43[1]	42
Number of employees with temporary contracts	4,232	4,454	4,795[1]	5,093
% of employees with temporary contracts	8	9	8[1]	9
thereof women	2,117	2,198	2,303[1]	2,423
thereof women (%)	50	49	48[1]	48
full-time employees	50,498	49,273	54,265	**55,220**
% full-time	95	95	95	95
thereof women	20,677	20,577	22,208	22,572
thereof women (%)	41	42	41	41
part-time employees	2,443	2,476	2,806	**2,907**
% part-time	5	5	5	5
thereof women	2,181	2,166	2,332	2,351
thereof women (%)	89	87	83	81

1 Employees whose contract type had not yet been recorded in our database by December 31, 2019 were divided up proportionally between the categories "employees with permanent contracts" and "employees with temporary contracts".

New employees

As of Dec. 31	2017	2018	2019[1]	2020 Merck Group	2020 thereof Merck KGaA
Total number of new employee hires	**7,285**	**7,129**	**7,924**	**6,669**	**500**
by age group					
up to 29 years old	2,940	2,967	3,432	2,889	259
30 to 49 years old	3,848	3,728	4,055	3,347	223
50 or older	497	434	437	433	18
by gender					
Women	3,412	3,401	3,622	3,016	186
Men	3,873	3,728	4,302	3,653	314
by region					
Europe	3,058	2,560	2,529	2,160	500
North America	1,603	1,524	1,733	1,789	not applicable
Asia-Pacific (APAC)	1,955	2,222	2,729	2,206	not applicable
Latin America	497	583	578	396	not applicable
Middle East and Africa (MEA)	172	240	355	118	not applicable
Rate of new employee hires[2] (%)	**14**	**14**	**14**	**11**	**6**
by age group[3]					
up to 29 years old	40	42	43	43	52
30 to 49 years old	53	52	51	50	45
50 or older	7	6	6	7	3
by gender[3]					
Women	47	48	46	45	37
Men	53	52	54	55	63
by region[3]					
Europe	42	36	32	32	100
North America	22	21	22	27	not applicable
Asia-Pacific (APAC)	27	31	34	33	not applicable
Latin America	7	8	7	6	not applicable
Middle East and Africa (MEA)	2	3	5	2	not applicable

1 These figures exclude the approximately 2,400 Versum Materials and Intermolecular employees who are not classified as new hires because they joined Merck as part of the acquisitions.

2 Formula for calculating the rate of new employee hires: Total number of new employee hires divided by number of employees at the end of the fiscal year.

3 Formula for calculating the rate of new employee hires by age/gender/region: New employee hires of the focus group divided by the total number of new employee hires.

Staff turnover[1,2]

	2017	2018[3]	2019	2020 Merck Group[4]	2020 thereof Merck KGaA
Total turnover rate	**9.05**	**9.09**	**9.07**	**8.22**	**3.30**
Turnover rate by gender					
Men	8.75	9.03	8.69	8.22	3.30
Women	9.46	9.18	9.54	8.22	3.29
Turnover rate by age group					
Up to 29 years old	13.66	14.24	13.13	11.30	3.35
30 to 49 years old	8.38	8.53	8.90	7.74	2.50
50 or older	7.87	7.39	7.03	7.52	4.48
Turnover rate by region					
Europe	6.22	5.73	5.72	5.64	3.30
North America	11.02	9.90	11.02	9.79	not applicable
Asia-Pacific (APAC)	12.53	14.51	13.18	10.60	not applicable
Latin America	13.74	15.41	13.47	11.40	not applicable
Middle East and Africa (MEA)	11.22	9.77	12.14	11.80	not applicable
Total number of leavers	**4,710**	**4,613**	**4,863**	**4,721**	**281**
by gender					
Men	2,596	2,578	2,621	2,697	191
Women	2,114	2,035	2,242	2,024	90
by age group					
Up to 29 years old	1,058	1,061	1,042	974	40
30 to 49 years old	2,713	2,649	2,898	2,677	110
50 or older	939	903	923	1,070	131
by region					
Europe	1,488	1,457	1,500	1,490	281
North America	1,143	1,064	1,264	1,281	not applicable
Asia-Pacific (APAC)	1,387	1,468	1,484	1,394	not applicable
Latin America	570	522	459	398	not applicable
Middle East and Africa (MEA)	122	102	156	158	not applicable

1 The table contains unadjusted turnover rates. The rate excludes employees who depart due to parental leave or a long-term illness, as well as employees who are transitioning to the non-working phase of partial retirement.

2 Employee headcount is calculated as follows: Total number of leavers from the past 12 months divided by the average employee headcount multiplied by 100.

3 Since 2018, the figures exclude the Consumer Health business, which was divested on December 1, 2018.

4 The figures do not reflect the approximately 500 Allergopharma employees, who were not included in the employee turnover rate due to the divestment of the business.

In 2020, the average length of service for employees Group-wide was 9.6 years (2019: 9.5 years), with 16.2 years (2019: 16.3 years) for Merck KGaA employees.

Work-related accidents[1]

	2017	2018	2019	2020 Merck Group[2]	2020 thereof Merck KGaA
Lost Time Injury Rate (LTIR = work-place accidents resulting in missed days of work per one million man-hours)	**1.5**	**1.2**	**1.6[3]**	**1.3**	**2.9**
by region					
Europe	2.4	1.8	2.6[3]	2.4	2.9
North America	1.0	1.1	1.0[3]	0.7	not applicable
Asia-Pacific (APAC)	0.3	0.3	0.2	0.1	not applicable
Latin America	1.3	1.5	1.7	0.9	not applicable
Middle East and Africa (MEA)	0.0	0.7	0.0	0.4	not applicable
Number of deaths	**0**	**0**	**0**	**0**	**0**
by region					
Europe	0	0	0	0	0
North America	0	0	0	0	0
Asia-Pacific (APAC)	0	0	0	0	0
Latin America	0	0	0	0	0
Middle East and Africa (MEA)	0	0	0	0	0
by gender					
Women	0	0	0	0	0
Men	0	0	0	0	0

1 Including supervised workers

2 The data include the divested Allergopharma business up to March 31, 2020. See the Report profile for further information.

3 Figure retroactively adjusted

Both Merck employees as well as supervised workers have been included in the calculation of these indicators.

Through the LTIR, we record work-related accidents that involve at least one day of missed work. A work-related accident is an injury that results from the type of work, in the course of doing said work, and that has no internal cause. Work-related accidents are considered relevant if they occur on the premises, on business trips, during goods transport, as a result of external influences (e.g. natural disasters), or due to criminal acts involving personal injury. Commuting accidents and accidents during company sporting activities are not included. First-aid incidents are generally not included in the LTIR since these usually do not result in more than one day of missed work.

We aimed to sustainably lower our LTIR to 1.5 by 2020. In the reporting year, we succeeded in outperforming this ambitious figure, which we achieved for the first time in 2015.

The LTIR is the key occupational safety indicator for the Merck Group as a whole. Therefore, we do not publish any other indicators such as workplace accidents, lost days or days of absence. The LTIR is not broken down by gender as this differentiation is not relevant to our strategic planning.

For Merck KGaA (about 15% of the employees of the Merck Group), we only report work-related illnesses if these have been certified as an occupational illness by the employers' liability insurance association. In 2020, no cases of work-induced illness were verified.

Employees who regularly receive a performance and development evaluation

	2017[1]	2018[1,2]	2019	2020 Merck Group	2020 thereof Merck KGaA
% of employees who receive a performance and development evaluation	**97**	**98**	**98**	**98**	**100**
by gender					
Women	97	99	98	98	100
Men	97	98	98	98	100
by employee category					
Senior management (Role 6+)	100	100	100	100	100
Middle management (Role 4 & 5)	100	100	100	100	100
Low management (Role 3)	100	100	100	100	100
Other employees (below Role 3)	96	98	98	98	100

1 In 2017 and 2018 the position assessment had not yet been carried out for employees of all Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma. In the facts and figures, these employees are included under "other employees (below Role 3)".

2 Since 2018, the figures exclude the Consumer Health business, which was divested on December 1, 2018.

Regular feedback and employee performance evaluations are essential to fairly ranking individual performance and to helping all employees follow their own career path at Merck. Our globally uniform Performance and Talent Management Process requires annual feedback meetings and performance assessments. Apart from evaluating employee performance, this helps us to identify individual development opportunities.

In Germany, all permanent employees have been participating in the Performance and Talent Management Process since 2013. In 2020, a total of 56,922 employees worldwide were involved in the process. The Performance and Talent Management Process is coordinated via our online platform HR4You.

Internationality of employees

As of Dec. 31	2017[1]	2018[1]	2019[2]	2020 Merck Group	2020 thereof Merck KGaA
Number of nationalities	131	136	139	141	87
Number of nationalities in management positions (Role 4 or above)	65	70	73	75	35
% of non-Germans in management positions (Role 4 or above)	64	64	64	66	11

1 In 2017 and 2018 the position assessment had not yet been carried out for employees of all Sigma-Aldrich legal entities in Germany, or for employees of Allergopharma.

2 In 2019, the position assessment had not yet been carried out for employees of Versum Materials as well as of Allergopharma.

Employee age by region

As of Dec. 31

Number of employees	Worldwide	North America	Europe (including Germany)	Merck KGaA	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2019							
Up to 29 years old	8,560	1,829	3,282	1,208	2,713	498	238
thereof women	3,983	773	1,595	440	1,225	289	101
30 to 49 years old	34,377	6,441	15,540	4,355	9,067	2,373	956
thereof women	15,076	2,733	7,191	1,465	3,531	1,200	421
50 or older	14,134	4,559	7,893	2,911	948	562	172
thereof women	5,481	1,779	3,123	814	293	201	85
Average age	**41.7**	**44.4**	**43.0**	**43.4**	**36.8**	**40.3**	**38.6**
Total employees	**57,071**	**12,829**	**26,715**	**8,474**	**12,728**	**3,433**	**1,366**
2020							
Up to 29 years old	8,570	1,906	3,193	1,161	2,800	472	199
thereof women	4,018	825	1,525	420	1,307	260	101
30 to 49 years old	34,974	6,615	15,416	4,458	9,669	2,323	951
thereof women	15,268	2,841	7,076	1,505	3,776	1,161	414
50 or older	14,583	4,791	7,978	2,959	1,049	592	173
thereof women	5,637	1,861	3,142	839	342	209	83
Average age	**41.7**	**44.4**	**43.1**	**43.4**	**37.0**	**40.7**	**39.1**
Total employees	**58,127**	**13,312**	**26,587**	**8,578**	**13,518**	**3,387**	**1,323**

Age of youngest employee

As of Dec. 31	2017	2018	2019	2020
Age of youngest employee, excluding apprentices	18	17	18	18

Voluntary insurance benefits (voluntarily introduced and (co-) financed)

As of Dec. 31	2017	2018	2019[1]	2020 Merck Group[1]	2020 thereof Merck KGaA
% of employees with healthcare benefits[2]	68	67	68	63	0
% of employees with Group accident insurance[3]	42	39	36	41	4
% of employees with life insurance[4]	58	58	58	56	0
% of employees with disability insurance (short-term and long-term)[5]	35	37	39	39	0

1 The figures exclude Versum Materials and Intermolecular since the integration process is still underway. For more information, see report profile.

2 Any spend on voluntarily introduced and (co-) financed healthcare benefits for employees and possibly their dependents. Not taking into consideration any mandatory social security cover (mostly covered by an insurance policy).

3 Any spend on voluntarily introduced and (co-) financed accident insurance that pays a defined amount in case of death or disability caused by a work-related accident (not taking into consideration any mandatory social security cover, e.g. workman's compensation).

4 Any spend on voluntarily introduced and (co-) financed life insurance cover that pays a defined amount of money in case of natural death (not accidental).

5 Any spend on voluntarily introduced and (co-) financed insurance cover that disability pays for salary continuation in case of inability to work caused by an insured incident.

All our employees are covered by either statutory or voluntary accident and health insurance. Employees of Merck KGaA are covered by statutory insurance as stipulated by the regulations in force in Germany.

We offer a company pension in numerous countries along with various programs for supplemental company pensions and survivor's benefits.

The global benefits listed in the table above are designed to provide additional security to our workforce and their families and to improve their quality of life. Benefits represent voluntarily employer-initiated as well as employer-financed assistance to our workforce in addition to the regular compensation package.

Our benefits offer meaningful choices, where possible, to support a diverse workforce and are sensitive to the needs and customs of the employees who use them, regardless of country, age, family status, interests, or values.

Long-term pension obligations and post-employment benefits

€ million	2017	2018	2019	2020
Present value of all defined benefit obligations as of Dec. 31	4,707	4,719	5,644	6,352
Pension expenses	304	319	357	408

Depending on the legal, economic and fiscal circumstances prevailing in each country, different retirement benefit systems are provided for the employees of the Merck Group. Generally, these systems are based on the years of service and salaries of the employees. Pension obligations of the Merck Group include both defined benefit and defined contribution plans and comprise both obligations from current pensions and accrued benefits for pensions payable in the future. In the Merck Group, defined benefit plans are funded and unfunded (see our Annual Report 2020, Note on Provisions for pensions and other post-employment benefits).

Flexible working hours in Germany

As of Dec. 31	2017	2018	2019	2020
% of employees utilizing the "mywork@Merck" working model	40	42	43	48

In coordination with their teams and supervisors, employees taking advantage of "mywork@merck" can choose when and where they work.

For more information on flexible working models during Covid-19, see Work-life balance chapter.

Parental leave[1]

As of Dec. 31	2017	2018	2019	2020
Number of employees with a right to parental leave	353	308	375	351
thereof women (recorded via maternity leave in the respective year)	151	188	239	225
thereof men (recorded via special paternity leave in the respective year)	202	120	136	126
Number of employees who took parental leave[2]	352	500	542	538
thereof women	150	240	248	265
thereof men	202	260	294	273
Number of employees on parental leave who worked part time during their leave	49	128	164	104
thereof women	47	109	140	73
thereof men	2	19	24	31
Number of employees who returned from parental leave[2]	312	312	536	529
thereof women	143	65	243	252
thereof men	169	247	293	277
Return to work rate (%)	88.6	62.4	98.9	98.3
thereof women	95.3	27.1	98.0	95.1
thereof men	83.7	95.0	99.7	101.5
Number of employees still working for Merck one year after their return from parental leave	238	268	496	-[3]
thereof women	89	26	218	-[3]
thereof men	149	242	278	-[3]
Retention rate (%)	89.8	93.1	92,5	-[3]
thereof women	85.6	63.4	89,7	-[3]
thereof men	92.5	97.9	94,9	-[3]

1 Figures pertain only to Merck KGaA (which accounted for around 15% in 2020). Figures are calculated on the basis of the data from one entire year, which also includes those employees who took parental leave during the calendar year but who had not yet returned by Dec. 31.

2 Since parental leave can be taken for a period ranging from one month to three years, it is possible for employees to be recorded across a period of up to four calendar years. This explains why the number of employees on parental leave exceeds the number of employees who have a right to it. It also explains why the "Number of employees who returned from parental leave" might exceed the "Number of employees who took parental leave".

3 Figure will be available on December 31, 2021.

Employees with disabilities[1] (%)

As of Dec. 31	2017	2018	2019	2020
Employees with disabilities	4.3	4.3	4.4	4.7

1 Only pertains to Merck KGaA (which accounted for around 15% of Merck Group employees in 2020, calculations based on the German Social Code IX - SGB IX).

Apprentices in Germany

As of Dec. 31	2017	2018	2019	2020
Number of apprentices	588	604	589	607
% of apprentices	4.4	4.5	4.3	4.6

Environment

Individual tables are part of the non-financial report

Total greenhouse gas emissions (Scope 1 and 2 of the GHG Protocol)[1]

metric kilotons	2006[2]	2017	2018[3]	2019	2020 Merck Group[4]	2020 Merck KGaA
Total CO_2eq[5] emissions	**754**	**653**	**636**	**630**	**2,010**	**132**
Thereof						
direct CO_2eq emissions (Scope 1)	352	341	332	341	1,706	108
indirect CO_2eq emissions[6] (Scope 2)	402	312	304	289	304	24
Biogenic CO_2 emissions	**0**	**13**	**13**	**13**	**13**	**0**

1 In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) greenhouse gas emissions were calculated based on the current corporate structure as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted). Exceptions to this are company units that were added as a result of the acquisition of Versum Materials. Figures dating back to the 2006 baseline are not available for these units.

2 Baseline for our emission targets is 2006.

3 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

4 Includes Versum Materials as of 2020. Excluding Versum Materials, our greenhouse gas emissions totaled 563 kilo tons in 2020.

5 eq = equivalent

6 The figures presented here have been calculated in accordance with the market-based method.

Our response to the Carbon Disclosure Project contains a detailed description of our calculation methods.

We have included the following gases in our calculation of direct and indirect CO2eq emissions:

- Direct CO_2 emissions: CO_2, HFCs, PFCs, CH_4, N_2O, NF_3, SF_6.
- Indirect CO_2 emissions: CO_2.

In 2020, we emitted 0.11 kg of CO_2eq per euro of net sales.

Other relevant indirect greenhouse gas emissions (Scope 3 of the GHG Protocol)[1]

	2017	2018	2019	2020
Total gross other indirect emissions (metric kilotons CO_2eq[2])	**328**[3]	**348**[3]	**339**[3]	**308**
Fuel- and energy-related emissions, not included in Scope 1 or 2 (category 3)	118	131	127	119
Waste generated in operations (category 5)[4]	43[3]	47[3,5]	50[3]	85
Business travel - air travel (category 6)	98	103	86	14
Business travel - rail travel (category 6)[6]	0.02	0.02	0.02	0.01
Business travel - rental car travel (category 6)	0.6	1.4	1.3	0.2
Employee commuting (category 7)	68	66	75	90[4]
Upstream leased assets (category 8)[7]	0.0	0.0	0.0	0.0
Processing of sold products (category 10)[8]	0.0	0.0	0.0	0.0
Downstream leased assets (category 13)	0	0	0	0
Franchises (category 14)	0	0	0	0

1 At present, we only record Scope 3 emissions globally, and not at site or legal entity level. For many categories, local allocations present a significant challenge. Currently the focus is on creating greater transparency with respect to our Scope 3 emissions at Group level. To this end, we are now analyzing emissions for the Scope 3 categories 1, 4 and 10 in particular.

2 eq = equivalent

3 Figure retroactively adjusted.

4 Since 2020, we apply a new calculation approach.

5 Since 2018, this figure has excluded the Consumer Health business, which was divested on December 1, 2018.

6 German Railway

7 Already covered under Scope 1 and 2 emissions

8 Merck produces a huge variety of intermediate products for various purposes. Due to their many applications and our customer structure, the associated greenhouse gas emissions cannot be tracked in a reasonable fashion.

No data are available for Scope 3 categories not listed above. Their relevance to Merck is assessed in the Scope 3 document.

Biogenic emissions (Scope 3), if present, are not being recorded.

Emissions of ozone-depleting substances

metric tons	2017	2018[1]	2019	2020
Total emissions of ozone-depleting substances	1.9	1.5	1.0	2.2
CFC-11eq[2]	0.1	0.1	0.1	0.1

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

2 CFC-11eq is a unit of measure used to compare the potential of various substances to deplete the ozone. Reference value 1 indicates the potential of CFC-11 to cause the depletion of the ozone layer.

Substances included: R-12, R-22, R-123, R-141b, R-401a, R-402a, R408a, R-409a, R-502, R-503.

Source for the emission factors: Montreal Protocol.

Other air emissions

metric kilotons	2017	2018[1]	2019	2020
Volatile organic compounds (VOC)	0.3	0.3	0.3	0.3
Nitrogen oxide	0.2	0.3	0.3	0.2
Sulfur dioxide	0.03	0.01	0.01	0.004
Dust	0.04	0.01	0.01	0.010

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

The VOC, nitrogen oxide, sulfur dioxide, and dust emissions reported here are attributable to production activities as well as energy generation. These figures do not include emissions from vehicles. Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

Transport of finished goods, by means of transportation

	2017	2018	2019	2020
% truck	73	74	70	70
% boat	15	14	19	22
% airplane	12	12	11	8

The figures contain the volumes of the biggest global distribution centers of our Healthcare, Life Science and Performance Materials business sectors. These figures pertain to the total weight of transported products and indicate the primary means of transport.

In shipping finished goods from our production sites to the local warehouses of our subsidiaries, we have been working to reduce the use of air shipping in favor of sea freight. This change aims to both reduce costs as well as lower transport-related CO_2 emissions.

Energy consumption[1]

In GWh	2017	2018[2]	2019	2020 Merck Group	2020 thereof Merck KGaA
Total energy consumption	**2,073**	**2,158**	**2,178**	**2,372**	**596**
Direct energy consumption	**1,205**	**1,261**	**1,288**	**1,265**	**529**
Natural gas	1,140	1,194	1,222	1,178	521
Liquid fossil fuels[3]	32	33	33	52	8
Biomass and self-generated renewable energy	33	34	33	35	0
Indirect energy consumption	**868**	**897**	**890**	**1,107**	**67**
Electricity	723	749	745	944	67
Steam, heat, cold	145	148	145	163	0
Total energy sold	**0.1**	**0.0**	**0.1**	**0.2**	**0.0**
Electricity	0.1	0.0	0.1	0.2	0.0
Steam, heat, cold	0	0	0	0	0
In TJ					
Total energy consumption	**7,463**	**7,770**	**7,839**	**8,539**	**2,146**
Direct energy consumption	**4,338**	**4,541**	**4,637**	**4,554**	**1,905**
Natural gas	4,104	4,298	4,399	4,241	1,876
Liquid fossil fuels[3]	114	119	119	187	29
Biomass and self-generated renewable energy	120	124	119	126	0
Indirect energy consumption	**3,125**	**3,229**	**3,202**	**3,985**	**241**
Electricity	2,603	2,696	2,682	3,398	241
Steam, heat, cold	522	533	520	587	0
Total energy sold	**0.4**	**0.0**	**0.5**	**0.7**	**0.0**
Electricity	0.4	0.0	0.5	0.7	0.0
Steam, heat, cold	0.0	0.0	0.0	0.0	0.0

1 In line with the Greenhouse Gas Protocol, for all previous years (up to the 2006 baseline) energy consumption has been calculated based on the current corporate structure as of Dec. 31 of the reporting year and retroactively adjusted for acquisitions or divestments of (parts of) companies, or for changes in emission factors (portfolio-adjusted). Exceptions to this are company units that were added as a result of the acquisition of Versum Materials. Figures dating back to the 2006 baseline are not available for these units.

2 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

3 Light and heavy fuel oil, liquefied petroleum gas (LPG), diesel, biodiesel, gasoline and kerosene

At our sites in Billerica (MA, United States), Bedford (MA, United States), Molsheim (France), Tel Aviv (Israel), Rome (Italy), Guatemala City (Guatemala), Shizuoka-ken (Japan), and Shanghai (China), we use photovoltaics to produce power.

Merck currently only records purchased secondary energy – this is primarily electricity and, to a lesser extent, heat/steam/cold. Details on the local energy mix, including the respective percentage of primary energy, renewable energy, etc. are not available. Data on local energy efficiency in electricity or heat generation are not available either. Our production sites are located in countries with a widely varying energy mix.

Our Darmstadt and Gernsheim sites in Germany consume the most energy, representing 25% of our Group-wide total. Here, fossil energy (coal, gas, etc.) accounts for approx. 42%, nuclear energy approx. 14% and renewable energies approx. 44% of the energy mix. Renewable energies account for a higher share of electricity generation at production sites in Switzerland, with nuclear energy taking the lead in France. Based on an estimated global energy efficiency of 37% for the conversion and distribution of generated electricity, this results in a primary energy consumption of 2,551 GWh for 2020. Based on an estimated global energy efficiency of 85% for heat/steam/cold, this results in a primary energy consumption of 192 GWh for 2020. This yields a total primary energy consumption of 2,743 GWh for 2020. (The calcula-

tion is based on factors stated in the "Manual for energy management in practice - Systematically reducing energy costs" published by DENA, 12/2012.)

In 2020, Merck's energy intensity relative to net sales totaled 0.14 kWh/€.

Water withdrawal

millions of m^3	2017	2018[1]	2019	2020 Merck Group	2020 Water stress areas
Total water withdrawal	**14.0**	**14.7**	**14.0**	**14.2**	**0.7**
Surface water (rivers, lakes)	1.9	2.1	1.9	1.9	0.0
Groundwater	7.3	7.2	6.8	6.7	0.4
Drinking water (from local suppliers)	4.8	5.3	5.2	5.5	0.3
Rain water and other sources	0.00	0.05	0.05	0.08	0.00

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

These figures do not include the ground water that we use for safety measures at our Gernsheim site in Germany. Here, the water is fed back directly into natural circulation.

The volume of seawater and produced water withdrawn is not significant and is therefore not reported separately.

Water reused

millions of m^3	2017	2018[1]	2019	2020
Water reused	22.4	24.4	23.3	22.0

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

The recirculating cooling system at our Darmstadt, Germany facility accounts for the majority of reused water as it allows the water to be re-utilized multiple times. The volume of reused water is thus greater than the total volume of consumed water.

Wastewater volume

	2017	2018[1]	2019	2020 Merck Group[2]	2020 Water stress areas
Total wastewater volume (millions of m^3)	**13.1**	**13.5**	**13.2**	**13.4**	**0.6**
Wastewater discharged directly	9.0	9.6	9.3	9.2	**0.4**
Wastewater discharged to third parties	3.7	3.9	3.8	4.1	0.2

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.

2 In 2020, we optimized the way we measure wastewater at our Gernsheim site. The figures reported no longer include wastewater from the municipality of Biebesheim.

The volume of seawater and groundwater discharged is not significant and is therefore not reported separately.

Discrepancies between total wastewater volume and the sum of directly discharged wastewater and wastewater sent to third parties arise from other disposal methods, which, however, only result in minor amounts of wastewater.

Direct discharges correspond to the "freshwater" classification of the GRI. Indirect discharges correspond to their "other water" classification.

Wastewater quality[1]

	2017	2018[2]	2019	2020
Chemical oxygen demand (metric tons of O_2)	1,537	1,509	1,568[3]	2,001
Phosphorous (metric tons)	8	10	12	15
Nitrogen (metric tons)	234	260	481	291
Nickel (kg)	32	30	32	30
Lead (kg)	35	30	34	37
Cadmium (kg)	6	6	6	6
Mercury (kg)	1	0	0	0

1 In alignment with ICCA reporting requirements specified by Cefic, we track heavy metal emissions from lead, cadmium, nickel, and mercury.
2 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.
3 Figure retroactively adjusted.

The wastewater treatment plant at our Gernsheim, Germany site also treats wastewater from the neighboring municipality of Biebesheim. The communal wastewater from Biebesheim is included in the emissions stated in the table.

Emissions are determined partially based on measurements and partially based on calculations or estimates. Only some sites are required to measure individual parameters.

These figures reflect the wastewater as it is when it leaves our facilities. Some of the substances in the water are then later removed by third-party purification plants before the water is ultimately discharged into the ecosystem.

Hazardous and non-hazardous waste

metric kilotons	2017	2018[1]	2019	2020
Total waste	**255**	**245**	**244**	**231**
Hazardous waste disposed[2]	43	44	44	38
Non-hazardous waste disposed[2]	33	54	41	34
Hazardous waste recycled[3]	72	75	78	89
Non-hazardous waste recycled[3]	107	72	81	70

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.
2 Disposed = incineration (without energy recovery) and landfill
3 Recycled = incineration (with energy recovery) and material recycling

We generally use external service providers in order to dispose of our waste outside our sites. Some material recycling of hazardous waste takes place directly at our sites (2020: approx. 46 metric kilotons).

Exported/Imported hazardous waste

metric kilotons	2017	2018[1]	2019	2020
Exported[2]	4.9	4.5	4.3	4.0
Imported	0.005	0.000	0.000	0.000

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.
2 Disposal primarily within the EU and the United States.

In 2020, approx. 3% of hazardous waste was shipped internationally.

Waste by disposal method

	2017	2018[1]	2019	2020
Total waste (metric kilotons)	**255**	**245**	**244**	**231**
Disposed waste	**76**	**98**	**85[2]**	**72**
Landfilled waste	13	35	26	17
Incinerated waste	63	63	59[2]	55
Recycled waste	**179**	**147**	**159[2]**	**159**
Material recycling	149	127	132	135
Waste-to-energy	30	20	27[2]	24
Recycling rate (%)	**70**	**60**	**65[2]**	**69**

1 Since 2018, our reported figures have excluded the Consumer Health business, which was divested on December 1, 2018.
2 Figure retroactively adjusted.

As in previous years, the total waste generated continues to be heavily influenced by the waste from construction and remodeling activities. Construction, excavation and demolition waste accounted for 21% of our waste in 2020. Around 37 metric kilotons of construction, excavation and demolition waste was recycled.

We generally use external service providers in order to dispose of our waste outside our sites. Some material recycling of hazardous waste takes place directly at our sites (2020: approx. 46 metric kilotons).

Significant spills

	2017	2018	2019	2020[1]
Total number of significant spills	0	0	0	0

1 The data include the divested Allergopharma business up to March 31, 2020. See the Report profile for further information.

community

Spending on community engagement

€ million	2017	2018[1]	2019	2020
Total spending	33.8	35.7	46.2	53.6

1 From 2018 on, we are separating spending on programs of the Merck Foundation from our community involvement figures.

We calculate the value of pharmaceutical product donations according to the WHO Guidelines for Medicine Donations; for other product donations, we apply their fair value.

Community engagement spending by region[1]

	Europe	North America	Asia-Pacific (APAC)	Latin America	Middle East and Africa (MEA)
2019					
€ million	10.6	3.4	2.3	0.5	29.3
%	23	7	5	1	64
2020					
€ million	**15.1**	**5.8**	**4.2**	**2.6**	**25.9**
%	**28**	**11**	**8**	**5**	**48**

1 This table presents the regions across the globe in which we support initiatives. For projects that benefit multiple regions, we have calculated the amount per region by dividing the project spending evenly per country.

Focus of our local community engagement[1]

%	2017	2018[2]	2019	2020
Global Health	38	34	33	36
Broad Minds: Education and culture	43	42	38	43
Sustainable Solutions: Environment	4	2	3	1
Disaster relief	2	2	2	1
Other	13	20	24	19

1 Based on number of projects

2 From 2018 on, we are separating spending on programs of the Merck Foundation from our community involvement figures.

Motivations for our community engagement[1]

%	2017	2018[2]	2019	2020
Charitable activities	9	7	6	23
Community investment	84	88	91	72
Commercial initiatives in the community	7	5	3	5

1 Based on total spending on all projects

2 From 2018 on, we are separating spending on programs of the Merck Foundation from our community involvement figures.

We categorize the motivations for our activities based on the London Benchmarking Group model as well as the guidelines of the Bertelsmann Foundation for corporate social responsibility. Projects that primarily aim to make improvements within the community are classified as community investment.

Initiatives that are predominantly aimed at company-relevant factors such as image or personnel recruitment are classified as commercial initiatives in the community. Charitable activities cover any other projects that benefit a charitable organization, but cannot be listed under either of the other two motivation categories due to missing data or their narrow scope.

Goals

Part of the non-financial report

Legend: New Goal | Goal achieved | In Progress | Goal not achieved

Business ethics

Compliance management

Goal: Bring compliance closer to the business

Action(s)	By	Progress by end of 2020	Status:
Third Party Risk Management	July 2020	Stepwise implementation of the new Third-Party Risk Management process commenced in November 2020.	In Progress

Goal: Standardize process for disclosure and documentation and increase awareness

Action(s)	By	Progress by end of 2020	Status:
Global harmonization of the Conflict of Interest process	November 2020	The Group Conflict of Interest Policy went live in November 2020 and is applicable to all Merck employees worldwide, excluding the two Healthcare legal entities in France. A confirmation course was rolled out for a specific target group in November 2020. The self-service digital disclosure process, including the documentation of the respective mitigation actions, has been implemented in a new ServiceNow workflow in August 2020 but rolled out together with the policy and confirmation course in November 2020.	Goal achieved

Supply chain standards

Goal: Ensure that suppliers adhere to ethical, social, environmental and compliance standards

Action(s)	By	Progress by end of 2020	Status:
Develop a due diligence process for Responsible Minerals Sourcing according to the OECD guidance for upstream processes and integrate it into the working processes of the affected units.	End of Q3/2019 – extended to Q4/2020	In 2020, we finalized a Group-wide conflict minerals due diligence process and published our respective Responsible Minerals Sourcing Charter.	Goal achieved
Develop a due diligence process for palm oil sourcing according to international guidance and implement it within the working processes of the affected units.	Extended to end of 2021	In 2020, ad-hoc validations of palm oil suppliers took place as needed. In 2021, we aim to develop a structured due diligence process for the procurement of palm oil.	In Progress

Animal welfare

Goal: Consistently ensure high quality across our animal facilities

Action(s)	By	Progress by end of 2020	Status:
Re-accredit relevant animal facilities.	Ongoing	No AAALAC re-accreditation was due in 2020 and all accredited sites maintained their status. The next re-accreditation is due in 2021.	
Implement organizational changes and create a new framework of rules for animal welfare to empower the businesses and manage risks.	End of 2021	A new Animal Affairs unit with independent Animal Welfare Officers has been set up. The implementation of other organizational changes will be finished by end of 2021.We have rewritten our Animal Affairs Policy and adopted six new standards.	
Ensure transparency and ease processes by digitalizing the Animal Affairs unit and developing an internal reporting system for all animal-related activities.	End of 2025	We are implementing a centralized IT landscape to support cross-functional processes and knowledge exchange, to foster transparency and manage risks. We identified and set up working groups that will implement procedures to ensure that all external and internal animal work is reported and KPIs are managed.	

Goal: Ensure animal welfare in our supply chain

Action(s)	By	Progress by end of 2020	Status:
Develop and implement an audit plan for suppliers.	Ongoing	Due to Covid-19-related travel restrictions, only limited audits were performed. With the help of partners, we carried out a total of 11 on-site audits of CRO facilities. Additionally, we set up five remote audits. We have implemented standards across our vendors globally and will prioritize the qualification of vendors based on risk assessments.	

Goal: Promote the 4Rs (Reduction, Refinement, Replacement, Responsibility)

Action(s)	By	Progress by end of 2020	Status:
Develop a Group-wide 4R program.	Ongoing	We added a fourth R (Responsibility) and presented our internal 4Rs Award to increase awareness. By mid-2021, we will agree on aligned and binding 4Rs KPIs for all our businesses conducting animal work and for the Animal Affairs unit.	

products

Health for all

Focus programs

Goal: Eliminate schistosomiasis

Hand in hand with partners, we aim to eliminate the tropical disease schistosomiasis worldwide.

Action(s)	By	Progress by end of 2020	Status:
Donate up to 250 million praziquantel tablets annually to the World Health Organization (WHO) for African school-age children	Ongoing	Following the orders for 2020 from WHO, we donated nearly 226 million tablets in 30 countries, 27 of which are in Africa. We continue to maintain production capacities at a level sufficient for manufacturing 250 million praziquantel tablets a year.	✓
Optimize the praziquantel formulation	End of 2020	In 2020, we further analyzed the results of the first bioequivalence study. We also concluded the second bioequivalence study successfully and submitted the results to WHO for pre-qualification.	✓
Initiate new partnerships to promote behavioral change in African school children Milestone 2020: Extend the partnership with the NALA Foundation	End of 2020	We extended our partnership with the NALA Foundation for an additional three years.	✓
Continue to strengthen the position of the Global Schistosomiasis Alliance (GSA) as a partner platform for advocacy, implementation, research, communication, and strategy development	Ongoing	In 2019 and 2020, the GSA contributed to the development of the WHO NTD roadmap 2021-2030 and will continue to work with its partners on its implementation.	✓

Goal: Availability – Address unmet needs through the research, development and optimization of health solutions

We aim to improve global health for underserved populations in low- and middle-income countries, with a focus on combating infectious diseases

Action(s)	By	Progress by end of 2020	Status:
Develop a pediatric formulation of praziquantel for the treatment of schistosomiasis in children under six. Milestone 2020: Completion of the clinical Phase III trial	End of 2020	The Phase III trial started in September 2019 at the Homa Bay clinical center in Kenya. The study is implemented in Kenya and Côte d'Ivoire. The Covid-19 pandemic impacted the implementation of this study; it was paused in line with national restrictions. As a result, project timelines have shifted, with an estimated completion of the Phase III in 2021.	⟳
Develop a pediatric formulation of praziquantel for the treatment of schistosomiasis in children under six. Milestone 2020: Develop access strategy for selected countries	End of 2020	The access strategy identified the need for an implementation field study in African countries. As part of the strategy, procurement access mechanisms for the pediatric formulation of praziquantel, including local manufacturing, are being defined to ensure that the pediatric medication reaches pre-school age patients in need.	✓
Develop a new antimalarial (PeEF2 inhibitor) Milestone 2020: Design of Phase II and identification of combination partner	End of Q4 2020	In addition to bringing Phase Ib (for cure) to completion, our work focused on designing a Phase II study, identifying a combination partner, and devising a commercialization path to tailor further development.	✓

Prices of medicines

Goal: Update our access to medicine strategic plan

Action(s)	By	Progress by end of 2020	Status:
Create a dedicated cross-functional working group to update our universal strategy for equitable pricing.	Ongoing	In addition to existing initiatives, we have begun defining new equitable strategy plans to make Mavenclad® available in low- and middle-income countries. The lessons learnt will be evaluated in 2021 for upcoming projects and product launches as an ongoing initiative.	

Goal: Provide patients with access to affordable, high-quality products by making more of our branded generics (branded off-patent products) available.

Action(s)	By	Progress by end of 2020	Status:
Continue with the expansion of our branded generics portfolio.	Ongoing	We are in the process of registering further branded generics in low- and middle-income markets.	

Goal: Provide "beyond-the-pill" solutions to patients, caregivers and physicians to enable better management of the condition while maximizing treatment outcomes.

Action(s)	By	Progress by end of 2020	Status:
We entered a partnership on a leading medication adherence solution, Medisafe, to pilot a customized program to cardiometabolic patients in Brazil, Mexico and Russia.	Ongoing	Following the successful pilots of a customized program to cardiometabolic patients in Brazil, Mexico and Russia in 2018/2019, we continued to serve relevant patients in Brazil and Russia and observed important improvements in adherence rates.	
We entered a partnership with a leading digital diabetes prevention program provider, Blue Mesa Health, to offer an effective and customized lifestyle counselling program to prediabetic patients across different regions.	Ongoing (2019 goals achieved, continue to develop/expand in 2020)	Following the successful piloting of the digital lifestyle intervention program in collaboration with Blue Mesa Health (acquired by Virgin Pulse), we are supporting the Virgin Pulse program in LATAM.	
We entered a partnership with leading health technology and data science company Holmusk to offer a patient lifestyle support program on its GlycoLeap platform.	2021	We offer the digital lifestyle intervention program "GlycoLeap" in collaboration with Holmusk to prediabetics and/or diabetics in Asia, particularly in Hong Kong, Indonesia and Malaysia.	

product safety and quality

Chemical product safety

Goal: Guided by the precautionary principle, establish a globally aligned hazard and risk communication system for all our relevant chemical products in the supply chain

Action(s)	By	Progress by end of 2020	Status:
Projects for hazard communication: Update safety data sheets for non-hazardous materials	End of 2020	In both our Life Science and Performance Materials business sectors, all safety data sheets for non-hazardous materials had been updated by the end of 2019, ahead of schedule. Since there are no non-hazardous materials in the Versum Materials portfolio and no chemicals at all in the Intermolecular portfolio, there were no safety data sheets for non-hazardous materials that required updating.	✓
Harmonize safety data sheets to align with a globally uniform standard	End of 2020	In our Life Science business sector, we have consolidated our SAP systems for hazard communication, creating a single platform approach. In Performance Materials, we generate safety data sheets through a centralized SAP system governed by globally consistent rules. The continued integration of Versum Materials focuses on converging work processes and requirements related to product compliance and sustainability.	✓

Patient safety

Goal: Enhance patient safety through stakeholder communication

Action(s)	By	Progress by end of 2020	Status:
Enhance patient interface in agReporter application and rollout of patient-centric pharmacovigilance videos.	Ongoing	We initiated the roll-out of the agReporter app in Kenya and Nigeria. As well optimized the usability of the app.	

Goal: Empower early and fully informed decisions by addressing unmet medical needs, deep biology and drug safety

Action(s)	By	Progress by end of 2020	Status:
Define a scoring model as basis for product prioritization and tiered portfolio management. Employ an objective scoring tool, based on critical safety and relevant cross-functional parameters.	2023	We incorporated the product prioritization tool during the development of the risk-based operating model in the Global Patient Safety unit. We published the initial version of the product prioritization tool in January 2020. Further details are in the chapter.	
Implement a risk-based approach in global patient safety processes to improve efficiency.	2023	We completed the design phase and started implementation of our risk-based operating model in the Global Patient Safety (GPS) unit.	
Develop real-time pharmacovigilance intelligence on global, regional and local levels to enable strategic decision-making..	2023	To ensure that requirements and guidance's of health authorities are met properly, we formed the Pharmacovigilance Intelligence Council. The council enables us to have better oversight and make decisions regarding our actions efficiently. To improve efficiency and timeliness in the assessment of new legislation, we are also working on a tool for process automation.	

Goal: Provide up-to-date safety information to our customers worldwide, based on the benefit-risk profiles of our products

Action(s)	By	Progress by end of 2020	Status:
Practice predictive safety by developing a robust, cross-functional benefit-risk strategy that helps us deliver therapies that are truly differentiated and provide transformational value to patients.	2023	We developed concepts, principles as well as guidance documents on the strategy of benefit-risk assessment We developed a change management plan to bring this new Benefit-Risk Strategy to every function. We are testing the new Benefit-Risk Strategy through several pilots, using products from our Healthcare portfolio.	
Optimize and automate the processing of individual case safety reports (ICSRs) from collection to reporting, in order to significantly reduce manual efforts and further improve quality, while maintaining a high level of timely compliance in reporting.	2023	The project team has worked on actions to streamline our activities and to move forward into long-term automation	

Product-related crime

Goal: Strengthening cross-functional collaboration within the global security network and raising awareness among other target audiences of the strategic relevance of counterfeit medicines.

Action(s)	By	Progress by end of 2020	Status:
Expand organizational structures and certify employees who deal with product-related crime.	Ongoing	In 2020, we started to build a regional corporate security management structure, which incorporates Product Crime Officers. This regional corporate security structure is intended to enable strong cross-functional collaboration. This is supposed to make security performance, incidents and risks at our sites more transparent. In addition, the new structure helps to establish a risk-based approach for more efficient security risk management. The introduction of this new structure is likely to be completed in 2021. In 2020, we also revised both of our internal guidelines for fighting product-related crime.	
Host conferences and seminars; share best practices and lessons learned through international networks	Ongoing	Due to Covid-19, no training sessions took place on site in 2020. We held virtual meetings.	
Establishing the "Security Academy" learning and communication platform with the aim of better imparting all Security functions and key stakeholder-relevant know-how.	Ongoing	Kick-off held in mid-February 2020, thereafter quarterly calls.	

Goal: Develop and implement security technologies and solutions for the authentication, identification, integrity, and security of the product supply chain

Action(s)	By	Progress by end of 2020	Status:
Support regional activities to counter product-related crime.	Ongoing	Completed a project in China in 2020 to monitor online marketplaces more purposefully and pinpoint suspected cases. As a result, we identified only a few counterfeit versions of our products.	
Step up Internet research to detect counterfeit products, illegal parallel imports as well as trademark infringements	Ongoing	Completed a project in China in 2020 to monitor online marketplaces in a more focused manner and investigate suspected cases. As a result, we identified only a few counterfeit versions of our products.	
Monitor counterfeit pharmaceuticals in conventional distribution channels as well as online sales	Ongoing	In 2020, we engaged a new Internet-monitoring provider to monitor counterfeit medicines worldwide.	

Goal: Provide and further develop the mobile compact laboratory Minilab™ by GPHF

Action(s)	By	Progress by end of 2020	Status:
Update the Minilab manuals and consolidate all test methods into one single volume.	End of 2020	French and Spanish versions of the manuals were completed in 2020.	

Transport and warehouse safety

Goal: Ensure warehouse and transport safety within our company and at contract warehouses and prevent incidents that pose a risk to people and the environment

Action(s)	By	Progress by end of 2020	Status:
Regularly evaluate audit results, incident reports and safety-related complaints and implement the resulting corrective actions	Ongoing	We drafted closure instructions for open shipping cartons intended for reuse and started implementing them in order to reduce our waste streams. Beyond this, in 2020 we did not identify any other aspects of transport and warehouse safety that could be improved by Group-wide measures.	

Employees

Career with us

Goal: Consistently fill at least two-thirds of leadership positions (Role 6+) with internal candidates

Action(s)	By	Progress by end of 2020	Status:
Use the Talent Management Process to identify suitable employees with leadership potential and optimize the process to systematically advance them	Ongoing	In 2020, 75% of vacant positions (Role 6+) were filled internally.	
Build a high-potential talent pool that reflects our demographic structure	Ongoing	We are continuously developing the talent pool further. The set-up of the pool reflects the diversity of the company.	

Goal: Position our Group as an attractive employer for university graduates

Action(s)	By	Progress by end of 2020	Status:
Participate in university fairs and organize in-house recruiting events for graduates; position our company via employer branding channels; partner with target universities, student initiatives and organizations/associations	Ongoing	We are continuously positioning ourselves as an attractive employer for university graduates. Due to the Covid-19 pandemic, there was less direct interaction with young talent. Career fairs did not take place at universities. Instead, we participated in virtual fairs nationally and internationally. Since we were unable to welcome student visitor groups to the Darmstadt site, our Visitor Communications team carried out the remaining site tours in virtual formats. As a result, student groups also continued to gain an insight into our company and our recruiters remained in contact with the student talent.	
Approach select target universities	Ongoing	We leveraged existing measures, for instance intensive collaboration with selected university departments and career services, to bolster our position as an attractive employer for university graduates.	

Goal: Increase the share of employees (Group-wide) with development plans to 70% by 2020

Action(s)	By	Progress by end of 2020	Status:
Conduct extensive internal communications and people development campaigns and optimize existing tools	End of 2020	The percentage of employees with development plans increased from 75% (2019) to 77% (2020).	
Create awareness and share knowledge	End of 2020	We are taking steps to raise awareness of development plans and help employees to create a solid one.	

Fairness and dialogue

Goal: Measure and improve employee engagement

Action(s)	By	Progress by end of 2020	Status:
Implement a regularly occurring process to measure employee engagement and derive actions to improve it..	Ongoing	In 2020 we once again conducted multiple employee surveys worldwide. Our leaders are responsible for analyzing the results, discussing them with their teams and taking appropriate action where necessary.	

Diversity and inclusion

Goal: Our target is to maintain a 30% representation of women in leadership roles (Role 4+) until 2021.

Action(s)	By	Progress by end of 2020	Status:
Deploy teams at business sector level to develop goals and measures to move women into positions in various hierarchies	End of 2021	All business sectors founded their own teams that are networked with one another and occupy themselves with objectives and measures. For example, all areas introduced our inclusion training. Moreover, we again offered specific sponsoring or mentoring programs for women.	

Health and safety

Goal: Reduce the lost time injury rate Group-wide (to 1.5 or less).

Action(s)	By	Progress by end of 2020	Status:
Reinforce our safety culture to prevent behavior-related accidents. Roll out our BeSafe! program at all legacy Sigma-Aldrich sites and monitor ongoing implementation via appropriate performance indicators.	End of 2020	In 2020, we achieved a Group-wide LTIR of 1.3. Manager training and safety walkabouts helped us maintain a high level of safety awareness. We implemented these measures across numerous sites.	

Environment

Environmental stewardship

Goal: Incorporate all production sites into our ISO 14001 Group certificate for environmental management systems.

Action(s)	By	Progress by end of 2020	Status:
At newly acquired production sites, introduce environmental management systems in line with our ISO 14001 Group certificate and certify them accordingly.	Ongoing	In 2020, 13 new sites were added to our Group certificate. All sites relevant to the Group certificate have already achieved ISO 14001:2015 certification.	

Climate action

Goal: 20% reduction in our direct and indirect greenhouse gas emissions (Scope 1 and 2) relative to the 2006 baseline

Action(s)	By	Progress by end of 2020	Status:
Systematically examine the energy consumption at our individual production sites	End of 2020	In 2020 we piloted a project on digital energy management. As part of the project, we developed software aimed at fully monitoring energy consumption, which will enable us to better analyze current consumption and devise targeted approaches to boosting energy efficiency.	
Identify and implement potential energy savings	End of 2020	In 2020, a variety of energy efficiency initiatives helped us save around 1,700 metric tons of CO_2eq at our global headquarters in Darmstadt.	
Reduce process-related emissions	End of 2022 (will be continued under new target)	Throughout 2018/2019, we initiated two process emission reduction projects that will continue through the year 2022. Taking 2018 production volumes as our baseline, these efforts are expected to save 55,000 metric tons of CO_2eq.	
Renewable energy	End of 2020	In 2020, we increased the percentage of electricity from renewable energy sources relative to total electricity purchased to 27% (2019: 19%). In line with the Greenhouse Gas Protocol (GHG Protocol), we are now capturing our emissions using both the market-based and the location-based approach.	

Goal: 50% reduction in our direct and indirect greenhouse gas emissions (Scope 1 and 2) by 2030 (2020 baseline)

Action(s)	By	Progress by end of 2020	Status:
We will start executing measures to achieve this goal in 2021.	2030		

Goal: 80% of purchased electricity will come from renewable sources

Action(s)	By	Progress by end of 2020	Status:
We will start executing measures to achieve this goal in 2021.	2030		

Goal: By 2040 achieve net zero carbon operations in terms of GHG Protocol Scope 1, 2 and 3 emissions

Action(s)	By	Progress by end of 2020	Status:
We will start executing measures to achieve this goal in 2021 alongside our efforts to achieve our 2030 targets.	2040		

Waste and recycling

Goal: Reduce the environmental impact of our waste disposal practices by a 5% reduction of our Waste Score by 2025 (2016 baseline)

Action(s)	By	Progress by end of 2020	Status:
Continuously look for ways to improve our production processes and disposal methods.	Ongoing	Through our ProMec initiative, we boosted the recycling rate of production waste at our Darmstadt site to 16%, thereby saving an additional 600 metric tons of waste in 2020. Furthermore, our site in St. Louis (Missouri, USA) shifted roughly 140 metric tons of its waste disposal from landfill to energy recovery in 2020.	

Water management

Goal: Introduce a sustainable water management system at 24 of our manufacturing facilities with high water consumption by 2020

Action(s)	By	Progress by end of 2020	Status:
Meet the "advanced" requirements set out in the CEFIC flagship self-assessment tool (stage 3). This will assess our sites' impact on the water situation in the vicinity of each individual site.	November 2020	During stage 3 of the self-assessment, we analyzed the environmental impacts caused by our discharged water. Building on this analysis, we stipulated mandatory requirements for our sites to be successfully implemented by the end of 2020.	

Goal: Reduce our water use at sites in water-stressed areas by 10% relative to the 2014 baseline

Action(s)	By	Progress by end of 2020	Status:
Processes optimized to curb water consumption at seven production sites in Mexico, Spain, Taiwan, and the United States.	2020	Water consumption has been reduced by 27% at the respective sites.	

Goal: Reduce our Water Intensity Score by 10% by 2025 (2019 baseline)

Action(s)	By	Progress by end of 2020	Status:
We will be implementing measures to achieve this goal starting in 2021.	2025		

Goal: Reduce environmentally relevant trace substance residues in the wastewater of all production sites to below the no-effect threshold

Action(s)	By	Progress by end of 2020	Status:
	2030	To drive our wastewater quality goal, we drafted a mandatory standard detailing the individual steps needed to achieve it.	

Recognition and rankings

The following overview presents a selection of major awards and recognition that we have received or achieved. Information on additional recognition and accolades received by individual businesses or sites can be found in the respective chapter of our 2020 Sustainability Report, or on our website.

Sustainability performance

Access to Medicine Index

Every two years, the Access to Medicine Foundation publishes the Access to Medicine Index. It benchmarks 20 of the world's largest research-based pharmaceutical companies on activities and initiatives that experts consider most relevant for access to medicine in low- and middle-income countries.

The Foundation revised the Access to Medicine Index methodology in 2020. The latest Index was published in January 2021. We came in eighth place (previously fourth place). Our position among the top ten confirms our continuous commitment to improving sustainable access to high-quality solutions for all. The ATM Index for 2021 recognized us for our performance in Research & Development, where we ranked fifth. Our leading role in Intellectual Property sharing also received accolades.

www.accesstomedicineindex.org

CDP climate and water

We've been reporting our climate actions to the CDP (formerly the Carbon Disclosure Project) since 2008. In 2020, our climate impact mitigation activities scored a B in the CDP, up from a C in 2019. This initiative measures the strategies companies use to reduce emissions along with their successes, as well as how they manage their risks and opportunities on climate change.

In addition to reporting on our climate action, since 2016 we have been reporting our water-related performance and processes to the CDP. In 2020, we again received a B for our water management practices.

The CDP evaluates companies' performance in the areas of climate and water on a scale from A to D-, with A being the top score.

www.cdp.net

EcoVadis rating

The independent rating agency EcoVadis evaluates suppliers from more than 160 countries across the categories of Environment, Labor and Human Rights, Ethics, and Sustainable Procurement. As a member of the Together for Sustainability initiative, we also undergo this assessment. We were again assessed in 2020, and with a score of 79/100 achieved platinum status, which put us among the top 1% of all participating companies.

www.ecovadis.com

ESG Rating from MSCI

MSCI ESG Research provides MSCI ESG Ratings on global public and a few private companies on a scale of AAA (leader) to CCC (laggard), according to exposure to industry-specific ESG risks and the ability to manage those risks relative to peers. In May 2020, we received a rating of AAA in the MSCI ESG Ratings assessment.

www.msci.com/esg-ratings

ESG Risk Rating from Sustainalytics

With the ESG Risk Rating Sustainalytics measures company's exposure to industry-specific material ESG risks and analyses how well companies are managing those risks. In December 2020, Sustainalytics ranked us 13th among 792 pharmaceutical companies with an overall "low" exposure to ESG risks.

www.sustainalytics.com

ESG company rating from ISS

In 2020, the Institutional Shareholder Services (ISS) group of companies again granted us Prime Status ("good" to "very good") as in 2019.

www.issgovernance.com/esg

The 100 Most Sustainably Managed Companies in the World

In 2020, The Wall Street Journal newly ranked the world's most sustainably managed companies focusing on companies' ability to create long-term shareholder value. Among all companies ranked we took fourth place while reaching the first place in the subranking "Social and product issues management". With the first place in the subranking we are recognized for our social initiatives such as our program to eliminate schistosomiasis.

www.wsj.com

The 200 most sustainable companies in Germany

In 2020, the magazine stern and the market research company Statista analyzed both the sustainability performance of German companies and the perception of these companies by citizens in the three ESG categories. Among 200 qualified companies, we took second place in the overall ranking on the most sustainable companies in Germany.

www.stern.de

sustainability indices

Ethibel Sustainability Index (ESI) Excellence Europe

Since 2015 we have been a constituent of the ESI Excellence Europe, a sustainability index that comprises the 200 top-rated European companies based on their corporate responsibility performance.

www.forumethibel.org

FTSE4Good Index Series

Since 2008, we have been included in the FTSE4Good Index Series, a leading international ethical investment stock market rating that annually measures the performance of companies in demonstrating strong environmental, social and governance practices.

www.ftserussell.com

STOXX® Global ESG Leaders Index

In 2020, our company was once again included in the STOXX Global ESG Leaders sustainability index, which assesses companies based on key environmental, social and governance criteria.

qontigo.com

awards

Prize for research and development

The R&D 100 Awards are among the most prestigious innovation awards in the world, honoring research and development pioneers. In November 2019, one of these awards recognized our first-to-market innovation Eshmuno® CP-FT Resin, which can be used to efficiently remove aggregates from antibodies, thus lowering the risk to patients. Moreover, this product yields higher capacities than traditional methods and results in a smaller ecological footprint from manufacturing.

www.rdworldonline.com

Top Project of the Year Award

In July 2020, we received the "Top Project of the Year Award" from the Environment + Energy Leader journal for our web-based tool DOZN™. With DOZN™ users can estimate the green scores of their processes and products in order to increase their sustainability.

www.environmentalleader.com

HR Excellence Award

In 2020, we received the HR Excellence Award for our project "Empowering Leadership" to transform our leadership culture. By setting clear expectations, providing training for managers at all levels, as well as conducting communication campaigns, we have been able to achieve strong impact within the company and rising indicators of leadership quality.

www.hr-excellence-awards.de

Most Attractive Employers ranking

The success of our efforts is also confirmed by our ranking among the 100 most attractive employers for students and professional scientists in Germany. This index is published annually by employer branding specialist Universum and involves a survey of more than 47,000 people. In the category of Natural Sciences, we ranked eleventh out of 100 in the student survey.

www.universumglobal.com

Award from Science Magazine

Science, a leading peer-reviewed academic journal, once more named us a top employer. Almost 8,000 employees and managers from biotech and pharmaceutical companies took part in the magazine's online survey, ranking our company sixth in 2020.

www.sciencemag.org

Non-financial report

Part of the non-financial report

Index to the combined separate non-financial report

In publishing our combined separate non-financial report (referred to in the following as "non-financial report"), we are meeting the legal requirements. In accordance with sections 289b (3) and 298 (2) of the German Commercial Code, the separate non-financial report of the Merck Group has been combined with the separate non-financial report of our parent company (Merck KGaA) and incorporated into our Sustainability Report. The following index provides an overview of the content of the non-financial report and contains links to the passages in the Sustainability Report that are relevant to the non-financial report. Except for pointers to the Management Report in the Annual Report, pointers to other parts of the report or links to external websites are not included in this non-financial report.

As required by Sections 289d and 315c (3) of the German Commercial Code, we have prepared this report in line with the Global Reporting Initiative Standards ("comprehensive" option).

Description of our business model

Our business model as well as our Group structure, governance and strategy are described under Company profile.

Strategic and organizational approach to sustainability

Under Governance, we present external guidelines and projects to which we have made a commitment, along with Group-wide guidelines that are the cornerstone of our responsible governance. Our sustainability strategy sets out how we practice corporate responsibility, both in terms of strategy and at the organizational level.

Material aspects and topics

To determine the aspects and topics of relevance to the non-financial report, we conducted a materiality analysis that identified several issues that could not be assigned to any of the five aspects defined as minimum contents under section 289c (2) of the German Commercial Code. Along with these five aspects, we have therefore decided to report on the following additional material topics:

Aspect	Topic
Environmental matters	▪ Environmental stewardship (incl. production residues in the environment and abandoned hazardous waste) ▪ Greenhouse gas emissions ▪ Energy efficiency and renewable energy ▪ Plant and process safety ▪ Transport and warehouse safety ▪ Chemical product safety (incl. chemical labeling) ▪ Supply chain standards (incl. Mica supply chain)
Employee-related matters	▪ Health and safety ▪ Good leadership ▪ Employee engagement ▪ Employee development ▪ Recruiting and retaining employees (incl. work-life balance) ▪ Diversity ▪ Future of work
Social matters	▪ Patient safety ▪ Product-related crime ▪ Prices of medicines ▪ Responsible marketing ▪ Data protection
Respect for human rights	▪ Bioethics (incl. genome editing) ▪ Clinical studies ▪ Supply chain standards (incl. Mica supply chain)
Anti-corruption and anti-bribery	▪ Compliance ▪ Interactions with health systems
Other topics	▪ Innovation and R&D ▪ Digitalization

As part of our approach to comprehensive risk and opportunity management, we also identify current and potential risks and opportunities resulting from environmental, social and governance aspects. This includes tracking information on the gross risks in terms of potential damage and probability, as well as the residual net risks remaining after mitigation measures have been executed. We did not identify any net risks that fulfill the materiality criteria as set forth by section 289c (3) no. 3 and 4 of the German Commercial Code. Additional risks are described in the Report on Risks and Opportunities in the combined management report.

Aspect: Environmental matters

Under "Environmental matters", we report on environmental stewardship (including production residues in the environment and abandoned hazardous waste), greenhouse gas emissions, energy efficiency and renewable energies, plant and process safety, chemical product safety (including chemical labeling), transport and warehouse safety, and supply chain standards (including Mica supply chain).

Topic	Concepts incl. due diligence processes and outcome of activities
Environmental stewardship (incl. production residues in the environment and abandoned hazardous waste)	■ Our approach to environmental stewardship ■ How we structure environmental stewardship ■ Our commitment: Standards and standard operating procedures ■ Provisions for environmental protection ■ Environmental stewardship projects and measures ■ Goals and progress: Environmental stewardship
Greenhouse gas emissions	■ Our contribution to climate action ■ How we structure our climate action ■ Our commitment: Standards and legal frameworks ■ Climate action projects and measures ■ Goals and progress: Climate action
Energy efficiency and renewable energies	■ Our contribution to climate action ■ How we structure our climate action ■ Our commitment: Standards and legal frameworks ■ Climate action projects and measures ■ Goals and progress: Climate action
Plant and process safety	■ Our approach to plant and process safety ■ How we organize our plant and process safety ■ Our commitment: Standards and legislation ■ Plant and process safety projects and measures
Chemical product safety (incl. chemical labeling)	■ Our approach to safe chemical products ■ How we ensure chemical product safety ■ Legal requirements and internal guidelines ■ Chemical product safety projects and measures ■ Goals and progress: Chemical product safety

Transport and warehouse safety	▪ Our approach to safe transport and storage ▪ How we achieve transport and warehouse safety ▪ Our commitment: Internal standards and international rules ▪ Transport and warehouse safety projects and measures ▪ Goals and progress: Transport and warehouse safety
Supply chain standards (incl. Mica supply chain)	▪ Our approach to making our supply chains more sustainable ▪ How we implement sustainability standards in the supply chain ▪ Our commitment: Guidelines and standards ▪ Supply chain standards projects and measures ▪ Our approach to responsibility in the mica supply chain ▪ How we organize our mica supply chain ▪ Our commitment: Compliance with guidelines and standards ▪ Mica supply chain projects and measures ▪ Goals and progress: Supply chain standards

Aspect: Employee-related matters

Under employee-related matters, we report on concepts pertaining to being an attractive employer, which includes health and safety, good leadership, employee engagement, employee development, recruiting and retaining employees (including work-life balance), diversity, and future of work.

Topic	Concepts incl. due diligence processes and outcome of activities
Health and safety	▪ Our approach to preventing accidents and promoting health ▪ How we manage occupational health and safety ▪ Our commitment: Policies and company agreements ▪ Occupational health and safety projects and measures ▪ Goals and progress: Health and safety
Good leadership	▪ Our approach to good leadership ▪ How we facilitate good leadership ▪ Our commitment ▪ Good leadership projects and measures

Employee engagement	■ Our approach to employee engagement ■ How we engage our employees ■ Our commitment: Group-wide Social and Labor Standards Policy ■ Fairness and dialogue projects and measures ■ Goals and progress: Fairness and dialogue
Employee development	■ Our approach to attracting and retaining talent ■ How we organize recruiting, vocational training and advanced training ■ Our commitment: Employee development guideline ■ Projects and measures ■ Goals and progress: Career with us
Recruiting and retaining employees (incl. work-life balance)	■ Our approach to attracting and retaining talent ■ How we organize recruiting, vocational training and advanced training ■ Projects and measures ■ Goals and progress: Career with us ■ Our approach to ensuring a good work-life balance ■ How we strengthen work-life balance ■ Our commitment: Group guidelines and local regulations ■ Work-life balance projects and measures
Diversity	■ Our approach to diversity and inclusion ■ Making diversity and inclusion a pillar of the company ■ Our commitment: Industry-wide projects and regulations ■ Diversity projects and measures ■ Goals and progress: Diversity and inclusion
Future of work	■ Digitalization in recruiting, vocational and advanced training ■ Leveraging the opportunities of digitalization

Aspect: Social matters

"Social matters" encompasses our relationship with consumers. Under this heading, we report on concepts relating to patient safety, product-related crime, prices of medicines, responsible marketing, and data protection.

Topic	Concepts incl. due diligence processes and outcome of activities
Patient safety	■ Our approach to ensuring patient safety ■ How we monitor patient safety ■ Our commitment: Guidelines and statutory requirements ■ Patient safety projects and measures ■ Goals and progress: Patient safety
Product-related crime	■ Our approach to product-related crime ■ How we are tackling product-related crime ■ Our commitment: Group-wide guidelines and standards ■ Product-related crime projects and measures ■ Goals and progress: Product-related crime
Prices of medicines	■ Our approach to pricing medicines ■ Setting medicine prices ■ Our commitment: Medicine price guidelines and principles ■ Medicine pricing projects and measures
Responsible marketing	■ Our approach to interacting with health systems ■ How we ensure transparency and compliance ■ Our commitment: Group-wide guidelines and industry standards ■ Responsible marketing projects and measures
Data protection	■ Our approach to data privacy ■ How we ensure data privacy ■ Our commitment: guidelines and standards ■ Data privacy projects and measures

Aspect: Respect for human rights

Under "Respect for human rights", we report on concepts related to bioethics (including genome editing), clinical studies and supply chain standards (including Mica supply chain).

Topic	Concepts incl. due diligence processes and outcome of activities
Bioethics (incl. genome editing)	■ Our approach to ethical business conduct ■ How we assess bioethics and digital ethics ■ Our commitment: Identifying topics and issues early on ■ Bioethics projects and measures
Clinical studies	■ Our approach to safe and transparent clinical studies ■ How we govern clinical studies ■ Our commitment: International guidelines and requirements ■ Projects and measures for safe and transparent clinical studies
Supply chain standards (incl. Mica supply chain)	■ Our approach to making our supply chains more sustainable ■ How we implement sustainability standards in the supply chain ■ Our commitment: Guidelines and standards ■ Supply chain standards projects and measures ■ Our approach to responsibility in the mica supply chain ■ How we organize our mica supply chain ■ Our commitment: Compliance with guidelines and standards ■ Mica supply chain projects and measures ■ Goals and progress: Supply chain standards

Aspect: Anti-corruption and anti-bribery

Under anti-corruption and anti-bribery, we report on compliance and interactions with health systems.

Topic	Concepts incl. due diligence processes and outcome of activities
Compliance	■ Our approach to compliance ■ How we ensure compliance ■ Our commitment: guidelines and standards ■ Compliance projects and measures ■ Goals and progress: Compliance management
Interactions with health systems	■ Our approach to interacting with health systems ■ How we ensure transparency and compliance ■ Our commitment: Group-wide guidelines and industry standards ■ Projects and measures for interactions with health systems

Other topics

In the following section, we report on material issues that are not covered in any of the five minimum aspects stipulated in section 289c (2) of the German Commercial Code:

Topic	Concepts incl. due diligence processes and outcome of activities
Innovation and R&D	■ Our approach to creating innovation ■ How we drive innovation ■ Our commitment: Protecting innovative ideas ■ Innovation and R&D projects and measures
Digitalization	■ Our approach to creating innovation

GRI content index

General disclosures

GRI Standards and Disclosure Number		Comment	Reference
Organizational profile			
102-1	Name of the organization		Company profile
102-2	Activities, brands, products, and services		Company profile Products & Industries
102-3	Location of headquarters		Company profile
102-4	Location of operations		Company profile List of shareholdings
102-5	Ownership and legal form		Company profile
102-6	Markets served		Company profile Macroeconomic and Sector-Specific Environment
102-7	Scale of the organization		Company profile Net sales Capitalization Consolidated Balance Sheet
102-8	Information on employees and other workers	Supervised workers such as temps are not logged in our employee data system.	Indicators: employees
102-9	Supply chain		Supply chain standards Mica supply chain
102-10	Significant changes to the organization and its supply chain		Company profile Report profile Fundamental Information about the Group
102-11	Precautionary Principle or approach		Sustainability strategy Patient safety Transport and warehouse safety Chemical product safety Health and safety Environmental stewardship Climate action Plant and process safety
102-12	External initiatives		Governance Stakeholder dialogue Sustainable Development Goals Global strategy Open innovation sharing Compliance management Human rights Mica supply chain Chemical product safety Diversity and inclusion

102-13	Membership of associations		Stakeholder dialogue Animal welfare Global strategy Human rights Mica supply chain Transport and warehouse safety Diversity and inclusion
Strategy			
102-14	Statement from senior decision-maker		Letter from the CEO
102-15	Key impacts, risks, and opportunities		Sustainability strategy Materiality analysis Sustainable Development Goals Report on Risks and Opportunities
Ethics and integrity			
102-16	Values, principles, standards, and norms of behavior		Sustainability strategy Animal welfare Governance Compliance management Responsible interactions with health systems Human rights Supply chain standards Sustainable Development Goals Bioethics Clinical studies Product-related crime Transport and warehouse safety Chemical product safety Good Leadership Career with us Fairness and dialogue Diversity and inclusion Work-life balance Health and safety Environmental stewardship Climate action Waste and recycling
102-17	Mechanisms for advice and concerns about ethics		Compliance management Responsible interactions with health systems Human rights Bioethics Clinical studies Animal welfare Diversity and inclusion Health and safety Indicators: business ethics

Governance

102-18	Governance structure		Sustainability strategy Management Statement on Corporate Governance
102-19	Delegating authority		Sustainability strategy Statement on Corporate Governance
102-20	Executive-level responsibility for economic, environmental, and social topics		Sustainability strategy Environmental stewardship Good Leadership
102-21	Consulting stakeholders on economic, environmental, and social topics		Sustainability strategy Stakeholder dialogue Materiality analysis Global strategy Responsible interactions with health systems
102-22	Composition of the highest governance body and its committees		Management Statement on Corporate Governance The Executive Board The Supervisory Board Objectives of the Supervisory Board with respect to its composition
102-23	Chair of the highest governance body		Management Statement on Corporate Governance
102-24	Nominating and selecting the highest governance body		Diversity and inclusion Management Statement on Corporate Governance Gender quota Diversity policy Objectives of the Supervisory Board with respect to its composition
102-25	Conflicts of interest		Compliance management Responsible interactions with health systems Information on corporate governance practices
102-26	Role of highest governance body in setting purpose, values, and strategy		Sustainability strategy Values and compliance Report of the Supervisory Board
102-27	Collective knowledge of highest governance body		Sustainability strategy The Executive Board Statement on Corporate Governance
102-28	Evaluating the highest governance body’s performance		Board of Partners The Supervisory Board Articles of Association Statement on Corporate Governance
102-29	Identifying and managing economic, environmental, and social impacts		Sustainability strategy Materiality analysis Compliance management Report on Risks and Opportunities Statement on Corporate Governance
102-30	Effectiveness of risk management processes		Sustainability strategy Compliance management Report on Risks and Opportunities Report of the Supervisory Board

102-31	Review of economic, environmental, and social topics		Sustainability strategy Compliance management Report on Risks and Opportunities Report of the Supervisory Board
102-32	Highest governance body's role in sustainability reporting		Report profile
102-33	Communicating critical concerns		Compliance management Values and compliance
102-34	Nature and total number of critical concerns	Due to the sensitive nature of critical concerns these figures are only for internal use (except where external reporting is legally required). Significant additions to or changes in the risk register are disclosed in due course to the Executive Board on an ad hoc basis, as per stipulations in the risk policy.	Compliance management Values and compliance
102-35	Remuneration policies		Compensation report
102-36	Process for determining remuneration		Career with us Compensation report
102-37	Stakeholders' involvement in remuneration		Career with us Compensation report Voting results Annual General Meeting 2020
102-38	Annual total compensation ratio	Competitive salaries and additional benefits not only increase our attractiveness as an employer; they also motivate our people and build loyalty to the company. The compensation we offer is based on market analyses in the relevant field and the value of the respective position, as well as the employee's skill set and performance. Our Global Rewards Policy defines the framework for compensation and benefits across the entire Group. As far as possible, we strive to offer all our employees comparable compensation structures. Furthermore, we monitor Compliance with minimum standards. We do not consider the information required under GRI 102-38 and GRI 102-39 to be relevant to assessing the fairness of our compensation structures.	Career with us

102-39	Percentage increase in annual total compensation ratio	Competitive salaries and additional benefits not only increase our attractiveness as an employer; they also motivate our people and build loyalty to the company. The compensation we offer is based on market analyses in the relevant field and the value of the respective position, as well as the employee's skill set and performance. Our Global Rewards Policy defines the framework for compensation and benefits across the entire Group. As far as possible, we strive to offer all our employees comparable compensation structures. Furthermore, we monitor Compliance with minimum standards. We do not consider the information required under GRI 102-38 and GRI 102-39 to be relevant to assessing the fairness of our compensation structures.	Career with us
Stakeholder engagement			
102-40	List of stakeholder groups		Stakeholder dialogue
102-41	Collective bargaining agreements		Fairness and dialogue
102-42	Identifying and selecting stakeholders		Stakeholder dialogue
102-43	Approach to stakeholder engagement		Stakeholder dialogue Materiality analysis Good Leadership Fairness and dialogue
102-44	Key topics and concerns raised		Materiality analysis Bioethics Transport and warehouse safety Fairness and dialogue

Reporting practice

102-45	Entities included in the consolidated financial statements		Report profile Company profile Notes to the Consolidated Financial Statements
102-46	Defining report content and topic Boundaries		Materiality analysis Report profile
102-47	List of material topics		Materiality analysis
102-48	Restatements of information		Report profile
102-49	Changes in reporting		Materiality analysis
102-50	Reporting period		Report profile
102-51	Date of most recent report		Report profile
102-52	Reporting cycle		Report profile
102-53	Contact point for questions regarding the report		Report profile
102-54	Claims of reporting in accordance with the GRI Standards		GRI Content Index Report profile
102-55	GRI content index		GRI Content Index
102-56	External assurance		Report profile Assurance Report

Economic standards

GRI Standards and Disclosure Number		Comment	Reference
GRI 201: ECONOMIC PERFORMANCE 2016			
103-1	Explanation of the material topic and its Boundary		Company profile Statement on Corporate Governance Economic performance Pension schemes Report on Risks and Opportunities
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
201-1	Direct economic value generated and distributed		Indicators: employees Indicators: economics Indicators: community Community engagement Consolidated Income Statement Consolidated Cash Flow Statement Operating Activities Personnel expenses
201-2	Financial implications and other risks and opportunities due to climate change	We report in detail on various aspects of climate change as part of our participation in the CDP (formerly known as the Carbon Disclosure Project).	Water management CDP Report on Risks and Opportunities
201-3	Defined benefit plan obligations and other retirement plans		Indicators: employees Pension schemes
201-4	Financial assistance received from government		Accounting: Property, plant and equipment Research and development costs
GRI 202: MARKET PRESENCE 2016			
103-1	Explanation of the material topic and its Boundary		Career with us
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
202-1	Ratios of standard entry level wage by gender compared to local minimum wage	This indicator is not relevant to us, which is why we do not collect data on the ratio of the standard entry level wage compared to local minimum wage. Our Global Rewards Policy applies to all our subsidiaries worldwide and guarantees a systematic compensation structure. Both base pay and short-term variable compensation are oriented to the median base pay of the relevant reference market. Our pay brackets are reviewed on an annual basis and reflect market conditions. It goes without saying that we always adhere to local minimum wage levels.	Career with us

202-2	Proportion of senior management hired from the local community	We promote both the recruitment of local employees and their international deployment at all hierarchical levels. We do not record the proportion of local managers, as this is not relevant for the strategic personnel management of our company.	Good Leadership
GRI 203: INDIRECT ECONOMIC IMPACTS 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Global strategy Focus programs Prices of medicines Pharmaceutical supply chain Health awareness
203-1	Infrastructure investments and services supported		Global strategy Pharmaceutical supply chain Mica supply chain Community engagement
203-2	Significant indirect economic impacts		Prices of medicines Pharmaceutical supply chain Focus programs Community engagement
GRI 204: PROCUREMENT PRACTICES 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Supply chain standards Mica supply chain Human rights
204-1	Proportion of spending on local suppliers	We have no internal guidelines stipulating that preference be given to local vendors in allocating contracts and therefore do not collect this type of data. In some countries local laws require contracts to be awarded to regional suppliers.	Supply chain standards
GRI 205: ANTI-CORRUPTION 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Compliance management Supply chain standards Values and compliance
205-1	Operations assessed for risks related to corruption		Compliance management Indicators: business ethics Values and compliance Report on Risks and Opportunities
205-2	Communication and training about anti-corruption policies and procedures		Compliance management Indicators: business ethics
205-3	Confirmed incidents of corruption and actions taken	As applicable, we report on risks from litigation and legal proceedings in our Report on Risks and Opportunities.	Compliance management Indicators: business ethics Report on Risks and Opportunities

GRI 206: ANTI-COMPETITIVE BEHAVIOR 2016			
103-1	Explanation of the material topic and its Boundary		Compliance management
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
206-1	Legal actions for anti-competitive behavior, anti-trust, and monopoly practices		Indicators: business ethics

Additional material topics

TECHNOLOGY (Innovation and R&D, Digitalization)			
103-1	Explanation of the material topic and its Boundary		Innovation and digitalization Good Leadership Career with us
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
DATA PROTECTION			
103-1	Explanation of the material topic and its Boundary		Data privacy
103-2	The management approach and its components		
103-3	Evaluation of the management approach		

Environmental standards

GRI Standards and Disclosure Number		Comment	Reference
GRI 301: MATERIALS 2016			
103-1	Explanation of the material topic and its Boundary	We only record the weight of the raw materials that are directly used in our pharmaceuticals and chemicals, which came to 387 kilotons in 2020 (2019: 434 kilotons). Additionally, we utilize operating supplies and packaging materials such as folding boxes, glass bottles and ampules.	Sustainable product design Packaging and recycling
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
301-1	Materials used by weight or volume	We only record the weight of the raw materials that are directly used in our pharmaceuticals and chemicals, which came to 387 kilotons in 2020 (2019: 434 kilotons). Additionally, we utilize operating supplies and packaging materials such as folding boxes, glass bottles and ampules.	Sustainable product design Packaging and recycling
301-2	Recycled input materials used	In all our endeavors, we attempt to efficiently utilize materials and recycle as much as possible. Where feasible, we use recycled materials (in packaging, for instance.) Overall, our company considers material consumption to be a major concern. There are few opportunities to use recycled material in our production processes, because our business model puts us at the start of the value chain. We therefore do not collect such data at the Group level. Individual data and measures are reported in the respective chapters.	Sustainable product design Packaging and recycling
301-3	Reclaimed products and their packaging materials	Owing to the multitude of products we supply and the minimal comparability of our various initiatives, we do not collect quantitative data at the Group level. The individual measures taken by our various businesses are reported in the respective chapters.	Sustainable product design Packaging and recycling
GRI 302: ENERGY 2016			
103-1	Explanation of the material topic and its Boundary		Climate action Environmental stewardship Sustainable product design
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
302-1	Energy consumption within the organization		Climate action Indicators: environment

302-2	Energy consumption outside of the organization	To date, we have not been tracking energy consumption outside our organization, but we are working to create more transparency on our Scope 3 emissions. In particular, we are currently analyzing Scope 3 emissions from categories 1, 4 and 10. In the coming years, we will be including all Scope 3 categories in our reporting and will also be incorporating indirect emissions from energy consumption outside our organization as well.	Indicators: environment
302-3	Energy intensity		Climate action Indicators: environment
302-4	Reduction of energy consumption		Climate action Indicators: environment
302-5	Reductions in energy requirements of products and services		Sustainable product design
GRI 303: WATER AND EFFLUENTS 2018			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Water management Environmental stewardship
303-1	Interactions with water as a shared resource		Water management
303-2	Management of water discharge-related impacts		Water management
303-3	Water withdrawal	The amount of seawater and produced water withdrawn is not significant and is therefore not reported separately.	Water management Indicators: environment
303-4	Water discharge	The volume of seawater and groundwater discharged is not significant and is therefore not reported separately.	Water management Indicators: environment
303-5	Water consumption	Most of the water we use in our production streams is released back into aquatic ecosystems through direct or indirect discharges. Evaporation processes are not a material part of our manufacturing operations. At individual manufacturing sites, we incorporate small amounts of water into our products. We are working to implement systems to track this. Because we lack the capacity for water storage, such information is irrelevant to our company.	Water management

GRI 304: BIODIVERSITY 2016			
103-1	Explanation of the material topic and its Boundary		Environmental stewardship Sustainable product design
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
304-1	Operational sites owned, leased, managed in, or adjacent to, protected areas and areas of high biodiversity value outside protected areas	Our land use planning takes biodiversity impacts into account, with appropriate protective measures being taken on a case-by-case basis.	Environmental stewardship
304-2	Significant impacts of activities, products, and services on biodiversity		Environmental stewardship
304-3	Habitats protected or restored		Environmental stewardship
304-4	IUCN Red List species and national conservation list species with habitats in areas affected by operations	Our land use planning takes biodiversity impacts into account, with appropriate protective measures being taken on a case-by-case basis.	Environmental stewardship
GRI 305: EMISSIONS 2016			
103-1	Explanation of the material topic and its Boundary		Climate action Environmental stewardship
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
305-1	Direct (Scope 1) GHG emissions		Climate action Indicators: environment
305-2	Energy indirect (Scope 2) GHG		Climate action Indicators: environment
305-3	Other indirect (Scope 3) GHG emissions		Climate action Indicators: environment CDP
305-4	GHG emissions intensity		Climate action Indicators: environment
305-5	Reduction of GHG emissions		Climate action Packaging and recycling Indicators: environment CDP
305-6	Emissions of ozone-depleting substances (ODS)		Indicators: environment
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions		Indicators: environment

GRI 306: WASTE 2020			
103-1	Explanation of the material topic and its Boundary		Waste and recycling Environmental stewardship
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
306-1	Waste generation and significant waste-related impacts		Waste and recycling
306-2	Management of significant waste-related impacts		Waste and recycling
306-3	Waste generated		Waste and recycling
306-4	Waste diverted from disposal		Indicators: environment
306-5	Waste directed to disposal		Waste and recycling Indicators: environment
GRI 307: ENVIRONMENTAL COMPLIANCE 2016			
103-1	Explanation of the material topic and its Boundary		Environmental stewardship
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
307-1	Non-Compliance with environmental laws and regulations		Environmental stewardship
GRI 308: SUPPLIER ENVIRONMENTAL ASSESSMENT 2016			
103-1	Explanation of the material topic and its Boundary		Supply chain standards Mica supply chain
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
308-1	New suppliers that were screened using environmental criteria		Supply chain standards
308-2	Negative environmental impacts in the supply chain and actions taken		Supply chain standards Mica supply chain

social standards

GRI Standards and Disclosure Number		Comment	Reference
GRI 401: EMPLOYMENT 2016			
103-1	Explanation of the material topic and its Boundary		Career with us Fairness and dialogue Work-life balance Human rights
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
401-1	New employee hires and employee turnover		Indicators: employees
401-2	Benefits provided to full-time employees that are not provided to temporary or part-time employees	Part-time employees receive the same eligibility for employee benefits as full-time workers. Employees with temporary contracts, however, are not entitled to all company benefits, such as a company pension.	Career with us
401-3	Parental leave		Work-life balance Indicators: employees
GRI 402: LABOR/MANAGEMENT RELATIONS 2016			
103-1	Explanation of the material topic and its Boundary		Fairness and dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
402-1	Minimum notice periods regarding operational changes	The regulations on periods of notice vary worldwide. We apply the rules that are in force locally. There is no need for us to track periods of notice at Group level.	

GRI 403: OCCUPATIONAL HEALTH AND SAFETY 2018

103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach	The disclosures under GRI 403 relate to our employees and other supervised staff, both internal and external. The employees of third-party contractors are not included.	Health and safety Transport and warehouse safety
403-1	Occupational health and safety management system		Health and safety
403-2	Hazard identification, risk assessment, and incident investigation		Health and safety Plant and process safety
403-3	Occupational health services		Health and safety
403-4	Worker participation, consultation, and communication on occupational health and safety	Occupational health and safety committees are required by law in Germany. All employees of Merck KGaA are therefore represented by such committees, which operate at the site level. These workers account for around 15% of our total workforce. The majority of sites outside Germany also have health and safety committees to represent their employees. The organization of these committees is the responsibility of our individual sites. Health and safety issues are governed Group-wide by our EHS Policy. The organizational implementation of this policy is the responsibility of our individual sites and is subject to local laws and regulations. Merck KGaA which accounts for approximately 15% of our total workforce, has works agreements in place on occupational health and safety.	Health and safety
403-5	Worker training on occupational health and safety		Health and safety Transport and warehouse safety Plant and process safety
403-6	Promotion of worker health		Health and safety
403-7	Prevention and mitigation of occupational health and safety impacts directly linked by business relationships		Health and safety Transport and warehouse safety Human rights Plant and process safety
403-8	Workers covered by an occupational health and safety management system		Health and safety
403-9	Work-related injuries	We have identified the lost time injury rate (LTIR) as a key performance indicator for our company.	Health and safety Plant and process safety Indicators: employees

403-10	Work-related ill health	No fatalities resulting from verified work-related illnesses were reported to Merck during the reporting period. Regarding types of work-related illnesses we do not collect quantitative data at the Group level. Our sites may collect occupational illness data as deemed necessary.	Health and safety Plant and process safety Indicators: employees
GRI 404: TRAINING AND EDUCATION 2016			
103-1	Explanation of the material topic and its Boundary		Good Leadership Career with us Diversity and inclusion
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
404-1	Average hours of training per year per employee	We do not keep track of the average hours our employees spend on vocational training and continuing education because this indicator does not have any bearing on the quality or success of our efforts.	
404-2	Programs for upgrading employee skills and transition assistance programs		Supply chain standards Human rights Product-related crime Transport and warehouse safety Good Leadership Career with us Fairness and dialogue Diversity and inclusion Work-life balance Environmental stewardship Plant and process safety
404-3	Percentage of employees receiving regular performance and career development reviews		Career with us Indicators: employees
GRI 405: DIVERSITY AND EQUAL OPPORTUNITY 2016			
103-1	Explanation of the material topic and its Boundary		Diversity and inclusion Fairness and dialogue Objectives of the Supervisory Board with respect to its composition
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
405-1	Diversity of governance bodies and employees		Diversity and inclusion Indicators: employees The Executive Board The Supervisory Board Objectives of the Supervisory Board with respect to its composition

405-2	Ratio of basic salary and remuneration of women to men	We cannot make any statements about the ratio of the basic salary and remuneration of women compared with men because our compensation systems and processes do not distinguish between women and men. The salaries we offer are predicated on the respective job description and are based on our Global Job Catalog, which has fixed salary bands that are identical for men and women. Variable salary components that fall under performance-based compensation are paid on the basis of whether mutually agreed targets have been achieved. A performance management system governs this process.	Career with us
GRI 406: NON-DISCRIMINATION 2016			
103-1	Explanation of the material topic and its Boundary		Diversity and inclusion Fairness and dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
406-1	Incidents of discrimination and corrective actions taken		Diversity and inclusion Indicators: business ethics
GRI 407: FREEDOM OF ASSOCIATION AND COLLECTIVE BARGAINING 2016			
103-1	Explanation of the material topic and its Boundary		Supply chain standards Human rights Fairness and dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
407-1	Operations and suppliers in which the right to freedom of association and collective bargaining may be at risk		Supply chain standards Human rights
GRI 408: CHILD LABOR 2016			
103-1	Explanation of the material topic and its Boundary		Supply chain standards Mica supply chain Human rights Fairness and dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
408-1	Operations and suppliers at significant risk for incidents of child labor		Supply chain standards Mica supply chain Human rights
GRI 409: FORCED OR COMPULSORY LABOR 2016			
103-1	Explanation of the material topic and its Boundary		Supply chain standards Human rights Fairness and dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor		Supply chain standards Human rights

GRI 410: SECURITY PRACTICES 2016			
103-1	Explanation of the material topic and its Boundary		Human rights
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
410-1	Security personnel trained in human rights policies or procedures	We are in the process of formalizing our processes for security risk assessments as part of our security governance framework and are planning to integrate human rights aspects into security-relevant processes such as trainings for security personnel in the future.	
GRI 412: HUMAN RIGHTS ASSESSMENT 2016			
103-1	Explanation of the material topic and its Boundary		Human rights Fairness and dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
412-1	Operations that have been subject to human rights reviews or impact assessments		Human rights Indicators: business ethics
412-2	Employee training on human rights policies or procedures		Human rights
412-3	Significant investment agreements and contracts that include human rights clauses or that underwent human rights screening		Human rights
GRI 414: SUPPLIER SOCIAL ASSESSMENT 2016			
103-1	Explanation of the material topic and its Boundary		Supply chain standards Mica supply chain Human rights
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
414-1	New suppliers that were screened using social criteria		Supply chain standards
414-2	Negative social impacts in the supply chain and actions taken		Supply chain standards Mica supply chain
GRI 415: PUBLIC POLICY 2016			
103-1	Explanation of the material topic and its Boundary		Stakeholder dialogue
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
415-1	Political contributions		Stakeholder dialogue

GRI 416: CUSTOMER HEALTH AND SAFETY 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Clinical studies Patient safety Product-related crime Chemical product safety Sustainable product design Report on Risks and Opportunities
416-1	Assessment of the health and safety impacts of product and service categories		Chemical product safety
416-2	Incidents of non-Compliance concerning the health and safety impacts of products and services	As applicable, we report on risks from litigation and legal proceedings in our Report on Risks and Opportunities.	Clinical studies Chemical product safety Report on Risks and Opportunities
GRI 417: MARKETING AND LABELING 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Compliance management Responsible interactions with health systems Patient safety Chemical product safety
417-1	Requirements for product and service information and labeling	All pharmaceuticals are subject to reporting and notification requirements, which we fulfill. In line with the statutory requirements, we provide our customers with easily accessible and relevant information on the safe handling and use of our chemical products. We report on the individual requirements in the respective chapters.	Patient safety Chemical product safety
417-2	Incidents of non-Compliance concerning product and service information and labeling		Patient safety Chemical product safety Report on Risks and Opportunities
417-3	Incidents of non-Compliance concerning marketing communications	As applicable, we report on risks from litigation and legal proceedings in our Report on Risks and Opportunities.	Report on Risks and Opportunities
GRI 418: CUSTOMER PRIVACY 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Data privacy Clinical studies
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data		Data privacy Clinical studies Indicators: business ethics
GRI 419: SOCIOECONOMIC Compliance 2016			
103-1 103-2 103-3	Explanation of the material topic and its Boundary The management approach and its components Evaluation of the management approach		Compliance management Report on Risks and Opportunities
419-1	Non-Compliance with laws and regulations in the social and economic area	As applicable, we report on risks from litigation and legal proceed-	Report on Risks and Opportunities

		ings in our Report on Risks and Opportunities.	

Additional material topics

ETHICAL CONDUCT (bioethics, clinical studies, animal welfare)			
103-1	Explanation of the material topic and its Boundary		Animal welfare Bioethics Clinical studies
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
HEALTH FOR ALL (access to health, prices of medicines, health awareness)			
103-1	Explanation of the material topic and its Boundary		Global strategy Focus programs Open innovation sharing Pharmaceutical supply chain Prices of medicines Health awareness
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
PRODUCT-RELATED CRIME			
103-1	Explanation of the material topic and its Boundary		Product-related crime
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
COMMUNITY ENGAGEMENT			
103-1	Explanation of the material topic and its Boundary		Community engagement
103-2	The management approach and its components		
103-3	Evaluation of the management approach		
FUTURE OF WORK			
103-1	Explanation of the material topic and its Boundary		Good Leadership Career with us
103-2	The management approach and its components		
103-3	Evaluation of the management approach		

global compact cop

2020 UN Global Compact Communication on Progress

We have been a participant in the United Nations Global Compact since 2005. As a signatory to the initiative, we have committed ourselves to ten principles derived from key UN conventions on human rights, labor, environment, and anti-corruption. At the same time, the UN Global Compact calls on all participating companies to work to implement these principles within their own sphere of influence.

The following table summarizes the key actions we took in 2020 to advance the principles of the Global Compact.

COMMUNICATION ON PROGRESS

UN GLOBAL COMPACT

This is our **Communication on Progress** in implementing the Ten Principles of the **United Nations Global Compact** and supporting broader UN goals.

We welcome feedback on its contents.

Link: www.unglobalcompact.org

Human rights

Principle 1:	**Key actions in 2020:**	**Relevant GRI disclosures:**	**Reference:**
Businesses should support and respect the protection of internationally proclaimed human rights.	▪ Monitored our human rights performance and practices through our "Compliance Risk Reporting and Self-Monitoring Process" ▪ Incorporated human rights and modern slavery into our "EHS StartUp!" training for new EHS managers ▪ Offered e-learning courses on our Human Rights Charter and our Social and Labor Standards Policy, targeted to all managing directors and senior leaders reporting directly to the Executive Board ▪ Integrated humans rights into our Site Security Standard ▪ Adopted and published our Conflict Mineral Charter ▪ Analyzed human rights risks connected to the deployment of new technologies	103-2: 412-1, 412-2	Compliance management Human rights

Principle 2:	**Key actions in 2020:**	**Relevant GRI disclosures:**	**Reference:**
Businesses should make sure that they are not complicit in human rights abuses.	▪ Invited suppliers to a Together for Sustainability seminar in Asia ▪ Conducted internal and external sustainability audits and inspections of suppliers and collected self-reported information ▪ Held the presidency of the Responsible Mica Initiative	412-3, 414-1, 414-2	Compliance management Supply chain standards Mica supply chain Human rights

Labor standards

Principle 3:	**Key actions in 2020:**	**Relevant GRI disclosures:**	**Reference:**
Businesses should uphold the freedom of association and the effective recognition of the right to collective bargaining.	▪ Conducted internal audits on workplace matters covered in our Human Rights Charter, which are specified in more detail in our Social and Labor Standards Policy ▪ Regularly and extensively included local employee representatives in company decision-making ▪ Reviewed human rights issues within the scope of our Site Security Risk Assessments ▪ Kept track of human rights issues through our "Compliance Risk Reporting and Self-Monitoring Process"	102-41, 402-1, 407-1	Compliance management Human rights Fairness and dialogue

Principle 4:	**Key measures in 2020**	**Relevant GRI disclosures:**	**Reference:**
Businesses should support the elimination of all forms of forced and compulsory labor.	▪ Conducted internal audits on workplace matters covered in our Human Rights Charter, which are specified in more detail in our Social and Labor Standards Policy ▪ Published on our website our UK Modern Slavery Statement, which has been endorsed by our Executive Board ▪ Incorporated human rights and modern slavery into our "EHS StartUp!" training for new EHS managers	409-1	Compliance management Supply chain standards Human rights Fairness and dialogue

Principle 5:	**Key measures in 2020**	**Relevant GRI disclosures:**	**Reference:**
Businesses should support the effective abolition of child labor.	▪ Conducted internal audits on workplace matters covered in our Human Rights Charter, which are specified in more detail in our Social and Labor Standards Policy ▪ Held the presidency of the Responsible Mica Initiative ▪ Conducted internal and external sustainability audits and inspections of suppliers and collected self-reported information	408-1	Compliance management Supply chain standards Mica supply chain Human rights Fairness and dialogue
Principle 6:	**Key actions in 2020:**	**Relevant GRI disclosures:**	**Reference:**
Businesses should support the elimination of discrimination in respect of employment and occupation.	▪ Developed goals and measures to achieve a more balanced gender structure across different hierarchical levels of our business sectors exceeded our 2021 target of maintaining a 30% representation of women (2020: 35%) in leadership roles (Role 4+) ▪ Supported numerous local and global employee networks ▪ Expanded the mandate of our Diversity Council in terms of LGBTQI+, disability and ethnicity ▪ Became a sustaining member of Charta der Vielfalt e.V., a German organization that promotes diversity in the workplace ▪ Executed a Group-wide training program on unconscious bias ▪ Expanded our flexible work options	102-8, 202-1, 202-2, 401-1, 401-3, 404-1, 404-3, 405-1, 405-2, 406-1	Diversity and inclusion Work-life balance

Environmental stewardship

Principle 7:	Key actions in 2020:	Relevant GRI disclosures:	Reference:
Businesses should support a precautionary approach to environmental challenges.	▪ Passed third-party ISO 14001:2015 audits at 13 sites ▪ Performed 10 internal EHS audits, with all audited sites being rated as "good" or "satisfactory" ▪ Reduced CO_2 emissions around 25% below our 2006 baseline (2019: 15%) amid operating business growth (2020 reduction target: 20% below 2006 baseline) ▪ Defined new climate action targets for 2030 and 2040 ▪ Took action to lower greenhouse gas emissions ▪ Reduced our water consumption at sites in water-stressed areas by 27% relative to the 2016 baseline (2019: 21%) ▪ Defined new water targets for 2025 and 2030 ▪ Worked towards shrinking the environmental footprint of our waste by 5% by 2025, as measured by our waste scoring system. In 2020, we achieved a 4.6% reduction (2019: 1.6%) ▪ Took measures to ensure product safety (for instance REACH, GHS), plant and process safety, and transport and warehouse safety (such as internal EHS audits)	201-2, 301-1, 302-1, 303-1, 305-1, 305-2, 305-3, 305-6, 305-7	Chemical product safety Transport and warehouse safety Environmental stewardship Climate action Waste and recycling Water management Plant and process safety

Principle 8:	Key actions in 2020:	Relevant GRI disclosures:	Reference:
Businesses should undertake initiatives to promote greater environmental responsibility.	▪ Systematically examined potential energy savings at our production sites ▪ Commercialized greener alternative products such as Cyrene™, our Stericup E filtration system and our microplastic-free functional filler RonaFlair ▪ Deployed reusable and recyclable packaging, which we also offer to our customers ▪ Offered sustainable mobility options to employees (such as "Jobticket" public transit passes and shared bicycles) ▪ Installed at our global headquarters an extensive electric vehicle charging infrastructure, part of which is available to our employees for their own personal use	301 - 308	Sustainable product design Packaging and recycling Climate action

Principle 9:	**Key measures in 2020**	**Relevant GRI disclosures:**	**Reference:**
Businesses should encourage the development and diffusion of environmentally friendly technologies.	▪ Leveraged DOZN™, our web-based tool for evaluating greener alternatives to various chemicals. It is also available in a customer-facing version. ▪ Developed sustainable products such as liquid crystal technologies, raw materials for natural cosmetics and "greener" alternatives to chemicals expanded our range of "green" solvents ▪ Reduced packaging materials and deployed more sustainable packaging as part of our SMASH Packaging sustainable packaging strategy ▪ Continued to expand the recycling programs for our Life Science and Performance Materials customers	302-4, 302-5, 305-5	Sustainable product design Packaging and recycling

Anti-corruption

Principle 10:	**Key measures in 2020**	**Relevant GRI disclosures:**	**Reference:**
Businesses should work against corruption in all its forms, including extortion and bribery.	▪ Performed 52 internal audits on corruption-related risks ▪ Expanded our range of e-learning courses to include anti-corruption and money laundering ▪ Expanded and carried out anti-corruption, antitrust, data privacy, and healthcare compliance training ▪ Continued to operate our SpeakUp Line, a free hotline for reporting corruption anonymously ▪ Formed partnerships and engaged stakeholders to coordinate and enhance anti-corruption efforts ▪ Published annual EFPIA transparency reports ▪ Rolled out new guiding principles and standards for ethical interactions with health systems	102-16, 102-17, 205-1, 205-2, 205-3, 415-1	Compliance management Responsible interactions with health systems

Assurance reports

Assurance report NFR

Part of the non-financial report

Limited Assurance Report of the Independent Auditor regarding the combined separate non-financial report[1]

To the Supervisory Board of Merck KGaA, Darmstadt

We have performed an independent limited assurance engagement on the non-financial statement of Merck KGaA (further "Company" or "Merck") according to § 315b of the German Commercial Code (HGB), that is combined with the non-financial statement of the parent company in accordance with § 289b HGB and integrated in the Sustainability Report 2020 of Merck (further "combined separate non-financial report") for the period from January 1 to December 31, 2020.

Management's Responsibility

The legal representatives of Merck are responsible for the preparation of the combined separate non-financial report in accordance with §§ 315b, 315c in conjunction with 289b to 289e HGB.

This responsibility of the legal representatives includes the selection and application of appropriate methods to prepare the combined separate non-financial report and the use of assumptions and estimates for individual disclosures which are reasonable under the given circumstances. Furthermore, the legal representatives are responsible for the internal controls they deem necessary for the preparation of the combined separate non-financial report that is free of – intended or unintended – material misstatements.

Practitioner's Responsibility

It is our responsibility to express a conclusion on the combined separate non-financial report based on our work performed within a limited assurance engagement.

We conducted our work in the form of a limited assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (Revised): "Assurance Engagements other than Audits or Reviews of Historical Financial Information", published by IAASB. Accordingly, we have to plan and perform the assurance engagement in such a way that we obtain limited assurance as to whether any matters have come to our attention that cause us to believe that the combined separate non-financial report of the Company for the period from January 1 to December 31, 2020, has not been prepared, in all material respects in accordance with §§ 315b and 315c in conjunction with 289b to 289e HGB. We do not, however, issue a separate conclusion for each disclosure. As the assurance procedures performed in a limited assurance engagement are less comprehensive than in a reasonable assurance engagement, the level of assurance obtained is substantially lower. The choice of assurance procedures is subject to the auditor's own judgement.

Within the scope of our engagement, we performed, amongst others, the following procedures:

- Inquiries of group-level personnel who are responsible for the materiality analysis in order to understand of the processes for determining material topics and respective reporting boundaries for Merck
- A risk analysis, including media research, to identify relevant information on Merck's sustainability performance in the reporting period
- Evaluation of the design and the implementation of systems and processes for the collection, processing and monitoring of disclosures, including data consolidation, on environmental, employee and social matters, respect for human rights, and anti- corruption and bribery matters
- Inquiries of group-level personnel who are responsible for determining disclosures on concepts, due diligence processes, results and risks, performing internal control functions and consolidating disclosures
- Inspection of selected internal and external documents
- Analytical procedures for the evaluation of data and of the trends of quantitative disclosures as reported at group level by all sites

[1] Our engagement applied to the German version of the combined separate non-financial report 2020. This text is a translation of the Independent Assurance Report issued in German, whereas the German text is authoritative.

- Evaluation of local data collection, validation and reporting processes as well as of the reliability of reported data based on a sample of the sites in Hometown in the USA and in Nantong in China in the form of virtual meetings
- Assessment of the overall presentation of the disclosures

As described in the combined separate non-financial report, Merck engaged external providers to perform assessments and audits. The evaluation of the adequacy and accuracy of the conclusions from these external assessments was not part of our limited assurance engagement.

In our opinion, we obtained sufficient and appropriate evidence for reaching a conclusion for the assurance engagement.

Independence and Quality Assurance on the Part of the Auditing Firm

In performing this engagement, we applied the legal provisions and professional pronouncements regarding independence and quality assurance, in particular the Professional Code for German Public Auditors and Chartered Accountants (in Germany) and the quality assurance standard of the German Institute of Public Auditors (Institut der Wirtschaftsprüfer, IDW) regarding quality assurance requirements in audit practice (IDW QS 1).

Conclusion

Based on the procedures performed and the evidence obtained, nothing has come to our attention that causes us to believe that the combined separate non-financial report of Merck KGaA for the period from January 1 to December 31, 2020 has not been prepared, in all material respects, in accordance with §§ 315b and 315c in conjunction with 289b to 289e HGB.

Restriction of Use/General Engagement Terms

This assurance report is issued for purposes of the Supervisory Board of Merck KGaA, Darmstadt, only. We assume no responsibility with regard to any third parties.

Our assignment for the Supervisory Board of Merck KGaA, Darmstadt, and professional liability as described above was governed by the General Engagement Terms for Wirtschaftsprüfer and Wirtschaftsprüfungsgesellschaften (Allgemeine Auftragsbedingungen für Wirtschaftsprüfer und Wirtschaftsprüfungsgesellschaften) in the version dated January 1, 2017 (https://www.kpmg.de/bescheinigungen/lib/aab_english.pdf). By reading and using the information contained in this assurance report, each recipient confirms notice of the provisions contained therein including the limitation of our liability as stipulated in No. 9 and accepts the validity of the General Engagement Terms with respect to us.

Frankfurt am Main, February 17, 2021

KPMG AG
Wirtschaftsprüfungsgesellschaft

[Original German version signed by:]

Glöckner **ppa. Meldau**
Wirtschaftsprüfer
[German Public Auditor]

Assurance report SR

Limited Assurance Report of the Independent Auditor regarding Sustainability Information[1]

To the Executive Board of Merck KGaA, Darmstadt

We have performed an independent limited assurance engagement on the qualitative and quantitative disclosures on sustainability in the "Sustainability Report 2020" (further "Report") of Merck KGaA, Darmstadt, (further "Company" or "Merck") for the period from January 1 to December 31, 2020, published at https://www.merckgroup.com/en/sustainability-report/2020/.

It was not part of our engagement to review product- or service-related information, references to external information sources, expert opinions and future-related statements in the Report.

Management's Responsibility for the Report

The legal representatives of the Company are responsible for the preparation of the Report in accordance with the Reporting Criteria. Merck applies the principles and standard disclosures of the Standards of the Global Reporting Initiative (GRI) in combination with the Corporate Accounting and Reporting Standard (Scope 1 und 2) and the Corporate Value Chain Standard (Scope 3) of the Greenhouse Gas Protocol initiative by the World Resources Institute and the World Business Council for Sustainable Development (WBCSD) as Reporting Criteria (further "Reporting Criteria").

The responsibility of the legal representatives includes the selection and application of appropriate methods to prepare the Report and the use of assumptions and estimates for individual qualitative and quantitative sustainability disclosures which are reasonable under the circumstances. Furthermore, the legal representatives are responsible for the internal controls they deem necessary for the preparation of the Report that is free of – intended or unintended – material misstatements.

Practitioner's Responsibility

It is our responsibility to express a conclusion on the Report based on our work performed within a limited assurance engagement.

We conducted our work in the form of a limited assurance engagement in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (Revised): "Assurance Engagements other than Audits or Reviews of Historical Financial Information" and the International Standard on Assurance Engagements (ISAE) 3410: "Assurance Engagements on Greenhouse Gas Statements", published by IAASB. Accordingly, we have to plan and perform the assurance engagement in such a way that we obtain limited assurance as to whether any matters have come to our attention that cause us to believe that the Report was not prepared, in all material respects, in accordance with the Reporting Criteria. We do not, however, issue a separate conclusion for each disclosure. As the assurance procedures in a limited assurance engagement are less comprehensive than in a reasonable assurance engagement, the level of assurance obtained is substantially lower. The choice of assurance procedures is subject to the auditor's own judgement.

Within the scope of our engagement, we performed, amongst others, the following procedures:

- Inquiries of group-level personnel responsible for the materiality analysis in order to understand the processes for determining material topics and respective reporting boundaries of Merck KGaA.
- A risk analysis, including media search, to identify relevant information on Merck KGaA's sustainability performance in the reporting period.
- Evaluation of the design and implementation of systems and processes for the collection, processing and monitoring of the qualitative and quantitative disclosures included in the scope of this engagement, including the consolidation of data
- Inquiries of group-level personnel who are responsible for determining and consolidating disclosures and for performing internal controls, including the explanatory notes
- Inspection of selected internal and external documents
- Analytical procedures for the evaluation of data and of the trends of quantitative disclosures as reported at group level by all sites
- Evaluation of local data collection, validation and reporting processes as well as of the reliability of reported data based on a sample of the sites in Hometown in the USA and in Nantong in China in the form of virtual meetings

[1] Our engagement applied to the German version of the Sustainability Information contained in the Sustainability report 2020. This text is a translation of the Independent Assurance Report issued in German, whereas the German text is authoritative.

- Use of the insights and relevant work regarding audit procedures performed for the group and statutory audit of the (consolidated) financial statements for the fiscal year 2020 of Merck KGaA for the information and indicators that were derived from those consolidated financial statements
- Evaluation of the consistency of GRI Standards in accordance with option "Comprehensive" as reported by Merck with the qualitative and quantitative disclosures in the Report
- Assessment of the overall presentation of the disclosures

As described in the Report, Merck engaged external providers to perform assessments and audits. The evaluation of the adequacy and accuracy of the conclusions from these external assessments was not part of our limited assurance engagement.

In our opinion, we obtained sufficient and appropriate evidence for reaching a conclusion for the assurance engagement.

Independence and Quality Assurance on the Part of the Auditing Firm

In performing this engagement, we applied the legal provisions and professional pronouncements regarding independence and quality assurance, in particular the Professional Code for German Public Auditors and Chartered Accountants (in Germany) and the quality assurance standard of the German Institute of Public Auditors (Institut der Wirtschaftsprüfer, IDW) regarding quality assurance requirements in audit practice (IDW QS 1).

Conclusion

Based on the procedures performed and the evidence obtained, nothing has come to our attention that causes us to believe that the qualitative and quantitative disclosures on sustainability for the period from January 1 to December 31, 2020, published in the Sustainability Report, have not been prepared, in all material respects, in accordance with the Reporting Criteria.

Restriction of use/General Engagement Terms

This assurance report is issued for purposes of the Executive Board of Merck KGaA, Darmstadt, only. We assume no responsibility with regard to any third parties.

Our assignment for the Executive Board of Merck KGaA, Darmstadt, and professional liability as described above was governed by the General Engagement Terms for Wirtschaftsprüfer and Wirtschaftsprüfungsgesellschaften (Allgemeine Auftragsbedingungen für Wirtschaftsprüfer und Wirtschaftsprüfungsgesellschaften) in the version dated January 1, 2017 (https://www.kpmg.de/bescheinigungen/lib/aab_english.pdf). By reading and using the information contained in this assurance report, each recipient confirms notice of the provisions contained therein including the limitation of our liability as stipulated in No. 9 and accepts the validity of the General Engagement Terms with respect to us.

Frankfurt am Main, March 12, 2021

KPMG AG
Wirtschaftsprüfungsgesellschaft

[Original German version signed by:]

Glöckner **ppa. Meldau**
Wirtschaftsprüfer
[German Public Auditor]

glossary

African sleeping sickness
Human African trypanosomiasis (HAT), also known as sleeping sickness, is a parasitic disease transmitted by the bite of the tsetse fly. The disease mostly affects poor populations living in remote rural areas of Africa. Untreated, it is usually fatal.

Big Data
Extremely large data sets that may be analyzed computationally to reveal patterns, trends and associations, especially relating to human behavior and interactions.

Biodiversity
The diversity of ecosystems, habitats and landscapes on earth, the diversity of the species, and the genetic diversity within a biological species or population.

Chagas disease
A potentially life-threatening illness caused by the protozoan parasite. An estimated eight million people are infected worldwide, mostly in Latin America.

Chaotropic
A chaotropic agent is a molecule in water solution that can disrupt the hydrogen bonding network between water molecules. This affects the stability of the native state of other molecules in the solution by weakening the hydrophobic effect.

Chatbot
A computer program or an artificial intelligence that conducts a conversation via auditory or textual methods.

CO2 equivalents
CO_2 equivalents (CO_2eq) indicate how much a specified quantity of a specific greenhouse gas contributed to the greenhouse effect, using the global warming potential of carbon dioxide as a reference.

CRISPR/Cas
A biomolecular method for targeting, cutting and editing the DNA of an organism (gene editing). Experts think this technique has great potential for curing diseases or generating plants and animals with new traits.

DMF
Dimethylformamide is a clear, colorless, hygroscopic liquid with a high dielectric constant. It is employed as a solvent in the production of textiles, pharmaceuticals, pesticides, and adhesives. The ECHA (European Chemicals Agency) has designated DMF as a substance of very high concern (SVHC) and included it in the candidate list for authorization.

Due diligence
A risk analysis exercised with particular care.

EDTA
Ethylenediaminetetraacetic acid (EDTA) is a chemical agent that sequesters metal ions to prevent DNA degradation.

EHS
Short for "Environment, Health and Safety", this refers to environmental management, health protection and occupational safety throughout a company.

End-user declaration
A binding customer statement regarding the intended use of a product.

Endemic countries
Countries in which a certain disease, in many cases an infectious disease, occurs.

EQ
Our Group Environment, Health, Safety, Security, Quality function

Equality Act
A pending U.S. law with a special focus on LGBTQI+ people (lesbian, gay, bisexual, transgender, queer or questioning, intersex, and additional self-identifying members of the community). It prohibits discrimination on the basis of the sex, sexual orientation and gender identity.

ESG ratings
These are used to assess a company's financial performance through factors that include aspects of environmental management, social issues and good governance.

Exposure assessment
The U.S. Environmental Protection Agency defines exposure assessment as the determination or estimation (qualitative or quantitative) of the magnitude, frequency, duration, and route of exposure between an agent and an organism. This analysis forms part of the chemical safety assessment process.

Freshwater
Water containing 1,000 mg or less of dissolved solids per liter.

Germline
The cell sequence from which the germ cells (oocytes and sperm) arise within the individual development of multicellular animals and humans. The somatic cell lines branching off from the germ line form the body (the

soma).

GHS
Short for "Globally Harmonized System of Classification and Labelling of Chemicals", this refers to an international standard system to classify chemicals that covers labeling as well as safety data sheets.

Good clinical practice (GCP)
An international quality standard that enforces tight guidelines on ethical aspects of clinical studies.

Good distribution practice (GDP)
An EU guideline that regulates the proper distribution of medicinal products for human use.

Good manufacturing practice (GMP)
A system for ensuring that products are consistently manufactured and controlled according to quality standards. These guidelines are used in the production of medicines, active pharmaceutical ingredients and cosmetics, as well as foodstuffs and feed.

Greenhouse gases
Gases in the atmosphere that contribute to global warming. They can be either naturally occurring or caused by humans (such as CO_2 emissions generated by burning fossil fuels).

GxP
The general term for good practice quality guidelines and regulations that are used in many fields, especially the medical, pharmaceutical and pharmaceutical chemistry industries.

Humanoid
A term that means human-like.

ICH
The International Council for Harmonisation of Technical Requirements for Pharmaceuticals for Human Use (ICH) aims to promote uniform assessment criteria for product registration in Europe, the United States and Japan. The ICH develops guidelines for the evaluation of the quality, effectiveness and safety of medicinal products.

In vitro
Procedures involving components of an organism that were isolated from their usual biological surroundings (such as test tube experiments).

In vivo
Latin for "within the living", this term describes processes that take place within a living organism.

Investigational drug
A pharmaceutical form of an active ingredient or placebo being tested or used as a reference in a clinical trial, including approved as well as unapproved products when used or assembled (formulated or packaged) in a way different from the approved form, when used for an unapproved indication, or when used to gain further information about an approved use.

ISO 14001
This international standard defines globally recognized requirements for an environmental management system.

ISO 45001
This international standard defines globally recognized requirements for an occupational health and safety management system.

ISO 50001
This international standard defines globally recognized requirements for an energy management system.

ISO 9001
This international standard defines globally recognized requirements for a quality management system.

Leishmaniasis
A group of diseases caused by protozoan parasites. These parasites are transmitted to humans by the bites of the infected female phlebotomine sand fly. There are three main forms of leishmaniasis: cutaneous, visceral or kala-azar, and mucocutaneous.

LGBTQI+
This abbreviation stands for Lesbian, Gay, Bisexual, Transgender, Queer or Questioning, Intersex, and additional self-identifying members of the community.

Liquid biopsy
Sampling and analysis of non-solid biological tissue such as blood.

Liquid crystals (LC)
A hybrid of a crystalline and liquid state. In general, molecules are perfectly arranged only when in a solid crystal state, in contrast to the liquid state, when they move around chaotically. However, liquid crystals are a hybrid of the two states: Although they are liquid, they exhibit a certain crystalline arrangement. Their rod-shaped molecules align themselves like a shoal of fish. In addition, they respond to the electromagnetic waves of light like tiny antennae. Therefore, such swarms of molecules can either allow specially prepared "polarized" light to pass through, or they can block it. This takes place in the pixels of liquid crystal displays – as it does similarly in liquid crystal windows, which can provide shade against sunlight.

Location-based approach
Location-based figures are calculated on the basis of the average emission factors of the area in which the electricity consumption takes place. In most cases, the average at country level is used here.

LTIR
The lost time injury rate measures the number of accidents resulting in missed days of work (one or more days) per one million man-hours.

Managing director
At Merck, this individual is ultimately responsible for ensuring that their subsidiary, including R&D and manufacturing centers, complies with all laws and regulations applicable to its business, including Merck Guidelines.

Market-based approach
Marked-based figures are calculated on the basis of emission factors provided by electricity suppliers specifically for the electricity they sell.

Neglected tropical disease (NTD)
Diseases that occur primarily in low- and middle-income countries. NTDs include schistosomiasis, intestinal worms, trachoma, lymphatic filariasis, and onchocerciasis. This group of diseases is called neglected because, despite the large number of people affected, they have historically received less attention and research funding than other diseases.

NMP
N-Methyl-2-Pyrrolidone a polar aprotic compound that is miscible with water and has good solvency properties. NMP is used in the manufacture of polymers, semiconductors, batteries and pharmaceuticals. The ECHA (European Chemicals Agency) has designated NMP as a substance of very high concern (SVHC) and included it in the candidate list for authorization.

Nucleases
A group of enzymes whose primary function is to partially or fully degrade nucleic acids.

OHSAS
The Occupational Health and Safety Assessment Series (OSHAS) is an international occupational health and safety management system. As of March 2021 the norm ISO 45001 will replace the former occupational health and safety standard OHSAS 18001.

Orodispersible tablet
A tablet that dissolves in the mouth within 30 seconds and does not have to be taken with water. The active ingredient is absorbed through the mucous membrane in the mouth and also partly through the lining of the stomach.

Other water
Water containing more than 1,000 mg of dissolved solids per liter.

Patent pool
A consortium of at least two competing companies that allows partners to share the use of patents relating to a particular technology.

Patient access programs
Self-sustaining commercial programs with a revenue-driven purpose which provide medicines for underserved populations, either through free products or a reduced treatment fee.

Patient support programs
Any organized system providing services and direct patient or patient-caregiver interactions that are intended and designed to educate patients about certain diseases, and help patients with access to and/or the management of prescribed medicines and/or disease outcomes and/or offer doctors support for their patients.

Payer formularies
A medication formulary is a list of prescription medications that are preferred by a recipient's health plan or insurer.

Pharmacovigilance
The science and activities related to the detection, evaluation, understanding, and prevention of adverse reactions or other drug-related problems.

Phase I study
Phase I clinical trials test a new therapeutic candidate in a small group of people (for example, 20-80) for the first time to evaluate safety (for instance, to determine a safe dosage range and to identify side effects).

Phase II study
Phase II clinical trials study the medical or behavioral intervention in a larger group of people (several hundred) to determine efficacy and to further evaluate its safety.

Phase III study
Phase III studies investigate the efficacy of the medical or behavioral intervention in large groups of human subjects (from several hundred to several thousand) by comparing the intervention to other standard or experimental interventions as well as to monitor adverse effects, and to collect information that will allow the intervention to be used safely.

Prediabetes
A condition regarded as indicative that a person is at risk of progressing to Type 2 diabetes.

Process-related emissions
Greenhouse gases released into the atmosphere during manufacturing operations.

Public-private partnership (PPP)
A collaboration between public sector (government) organizations, private companies and/or not-for-profit organizations.

Pulse survey
A pulse survey is a short employee survey that focuses on a specific topic to gauge the current sentiment of the

workforce. This can, for example, relate to a single business unit in the case of change processes or be targeted to the entire workforce, as in the case of the Covid-19 pandemic.

(Q)SAR

Structure-activity relationship (SAR) and quantitative structure-activity relationship (QSAR) models – collectively referred to as (Q)SARs – are mathematical models that can be used to predict the physicochemical, biological and environmental fate properties of compounds from the knowledge of their chemical structure. These models are available for free or as commercial software.

Read-across

Grouping of substances and read-across is one of the most commonly used alternative approaches for filling data gaps in registrations submitted under REACH. This approach uses relevant information from analogous ('source') substances to predict the properties of 'target' substances. If the grouping and read-across approach is applied correctly, experimental testing can be reduced as there is no need to test every target substance.

Registration dossiers

One part of the REACH registration process is the preparation of a technical dossier and its submission to the European Chemicals Agency (ECHA). The information that a registration dossier should contain includes the physical-chemical, toxicological and ecotoxicological characteristics of the substances, human and environmental exposure, intended uses, classification and labelling, and recommended risk management measures.

Risk-sharing agreement

An agreement between the producer or manufacturer and the payer or provider that allows access to a health technology through coverage or reimbursement under certain conditions.

Robotics

Robotics or robot technology concerns the drafting, design, control, production, and operation of robots, e.g. industrial or service robots.

Role

Merck uses a market-oriented system to rate positions within the company. To facilitate consistency across the organization, each position is assigned a specific role, with an overarching job architecture classifying each role as one of 11 levels, 15 functions and an array of career types (Core Operations, Services & Support Groups; Experts; Managers; Project Managers).

Schistosomiasis

A parasitic disease spread in warm lakes and ponds by snails that serve as intermediate hosts.

Scope 1

Scope 1 includes emissions that occur in our company, for example in the generation of energy from fossil fuels.

Scope 2

Scope 2 includes emissions from purchased energy such as electricity or district heating.

Scope 3

Scope 3 includes indirect greenhouse gas emissions, such as the extraction and production of purchased materials, transport-related activities, waste disposal, and employee travel.

Scorecard

An evaluation tool for measuring, documenting and controlling activities using metrics.

Security

This term stands for all necessary measures and governance activities to detect, analyze, handle, and mitigate security- and crime-based threats to the company. This helps to protect employees as well as the tangible and intangible assets of the company.

Signal management

A set of activities performed to determine whether, based on an examination of individual case safety reports, aggregated data from active surveillance systems or studies, scientific literature information, or other data sources, there are new risks associated with an active substance or a medicinal product or whether known risks have changed, as well as any related recommendations, decisions, communications, and tracking.

Soil-transmitted helminthiasis (STH

Soil-transmitted helminthiasis (STH) is considered the most widespread of NTDs and has a particularly damaging impact on the health and development of children. Approximately 1.5 billion people, nearly 20% of the world's population, are infected with STH. It is transmitted by eggs present in human feces, which can contaminate the soil in areas where sanitation is poor. The most common species that affect people are roundworm, whipworm, and hookworm.

Spontaneous reports on adverse effects

If a side effect occurs while using a medicine and is reported, this is called a spontaneous report because the adverse reaction is reported spontaneously (for example by doctors or patients) and not in a trial or an observational study.

Stakeholder

People or organizations that have a legitimate interest in a company, entitling them to make justified demands. Stakeholders include people such as employees, business partners, neighbors in the vicinity of our sites, and shareholders.

STEM

Science, technology, engineering and mathematics.

Stem cell lines
Groups of stem cells derived from animal or human tissue. They can be cultivated in vitro and multiply indefinitely.

Stem cells
Undifferentiated cells with the potential to develop into many different cell types that carry out different functions.

Sunshine Act
The Sunshine Provisions of the U.S. Patient Protection and Affordable Care Act aim to create more transparent relationships between manufacturers of drugs, medical devices and medical aids on the one hand, and doctors and teaching hospitals on the other.

Thin films
A very thin layer (one atom or one molecule thick) of a substance deposited on a supporting material such as a semiconductor. Customers use our products to create such thin films.

Traces
Substances dissolved in water that are present only in minute amounts. Also referred to as micropollutants, these are synthetic substances present in concentrations ranging from one nanogram to one microgram per liter of water.

Transfer of value
Direct and indirect transfers of value, whether in cash, in kind or otherwise (for instance promotional purposes).

Translational cell culture models
A cellular model system that recapitulates and/or predicts a specific human (in vivo/clinical) outcome.

TRIPS
The Agreement on Trade-Related Aspects of Intellectual Property Rights is an international legal agreement between all the member nations of the World Trade Organization. TRIPS seeks to ensure that the measures and procedures for enforcing intellectual property rights do not become a barrier to lawful trade.

Vivarium
The vivarium, also known as animal research facility, is a specially designed building type, which accommodates controlled environments for the care, use and maintenance of experimental animals.

WASH
This stands for “water, sanitation and hygiene”.

WLTP
Lawmakers require standardized test procedures to measure how much fuel a car consumes and whether it complies with the emissions limits. The new Worldwide Harmonised Light Vehicle Test Procedure (WLTP) took effect in the EU on September 1, 2017 and is now the official type approval testing procedure for new passenger cars across the EU. It succeeded the NEDC (New European Driving Cycle), which took effect in 1992.

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