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Report - Novartis in Society

Contribution
by

Novartis

Novartis in Society 2018

NOVARTIS

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Cover photo Mukamudenge Melaniya, a potter living in rural Rwanda, receives treatment for malaria and other ailments at a local healthcare outpost run by a nurse entrepreneur and affiliated with One Family Health, a nongovernmental organization.

2018 highlights

ETHICAL STANDARDS

54%
REDUCTION
in the number of reported complaints of fraud and professional practices in the sales force in 2018 vs. 2017

100+
PEOPLE
added to the Integrity & Compliance function in recent years

220
COUNTRY VISITS
conducted by the Integrity & Compliance function in 2018

ACCESS TO HEALTHCARE

No. 2
RANKING
in the 2018 Access to Medicine Index, up from third position in 2016

24m
PATIENTS
reached through access programs

17m
PEOPLE
reached through training, health education and service delivery programs

GLOBAL HEALTH

USD 100m
INVESTMENT
committed over the next five years to advance R&D of new antimalarials

~900m
TREATMENT COURSES
of *Coartem* delivered without profit to date

7.2m
PATIENTS REACHED
with free multidrug therapy for leprosy since 1999

CORPORATE CITIZENSHIP

No. 2
RANKING
in the 2018 Thomson Reuters Diversity & Inclusion Index, up from sixth in 2017

140+
SUCCESSFUL ENFORCEMENT CASES
initiated or supported to combat falsified and counterfeit medicines

50%
REDUCTION
in our carbon footprint, including our supply chain, by 2030 (vs. 2016)

Who we are

Our purpose

We reimagine medicine to improve and extend people's lives. We use innovative science and technology to address some of society's most challenging healthcare issues. We discover and develop breakthrough treatments and find new ways to deliver them to as many people as possible. We also aim to reward those who invest their money, time and ideas in our company.

Our company

INNOVATIVE MEDICINES

The Innovative Medicines Division has two business units:

Novartis Oncology
Novartis Oncology focuses on patented treatments for a variety of cancers and rare diseases.

Novartis Pharmaceuticals
Novartis Pharmaceuticals focuses on patented treatments in the areas of ophthalmology; immunology, hepatology and dermatology; neuroscience; respiratory; and cardio-metabolic.

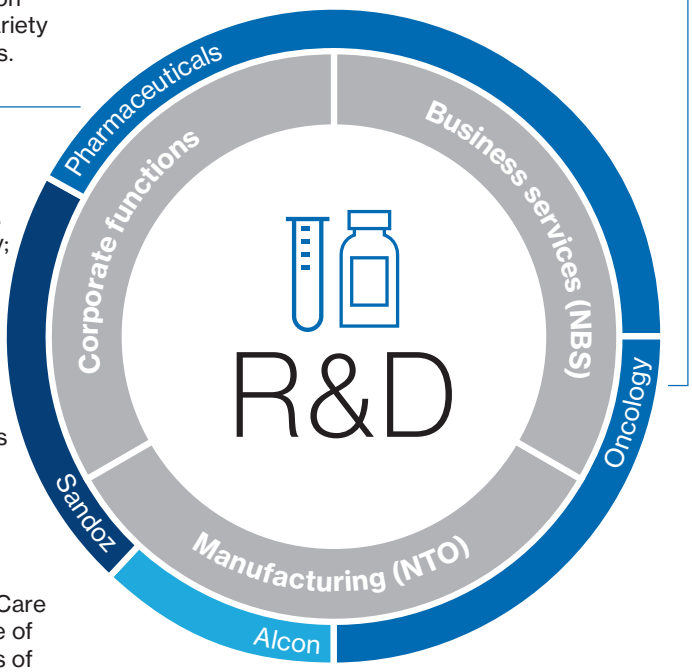
SANDOZ

Sandoz offers patients and healthcare professionals high-quality, affordable generics and biosimilars.

ALCON

With its Surgical and Vision Care businesses, Alcon offers one of the world's widest selections of eye care devices – from sophisticated equipment for delicate eye surgery, to a wide portfolio of advanced contact lenses.

In 2018, Novartis announced the intention to spin off Alcon, pending approval from shareholders and regulators.



RESEARCH AND DEVELOPMENT (R&D)

The Novartis Institutes for BioMedical Research (NIBR) is the innovation engine of Novartis. NIBR focuses on discovering new drugs that can change the practice of medicine.

The Global Drug Development (GDD) organization oversees the development of new medicines discovered by our researchers and partners.

NOVARTIS TECHNICAL OPERATIONS (NTO)

handles manufacturing of innovative medicines and Sandoz products. NTO helps us optimize resource allocation and capacity planning across our production sites.

NOVARTIS BUSINESS SERVICES (NBS)

consolidates support services across our organization, helping drive efficiency, simplification, standardization and quality.

CORPORATE FUNCTIONS

Corporate functions support the enterprise in specific areas of expertise, including finance, human resources, legal and communications.

Who we are

Our culture

Curious
Inspired
Unbossed

Our values

Innovation
Quality
Collaboration
Performance
Courage
Integrity

Our people

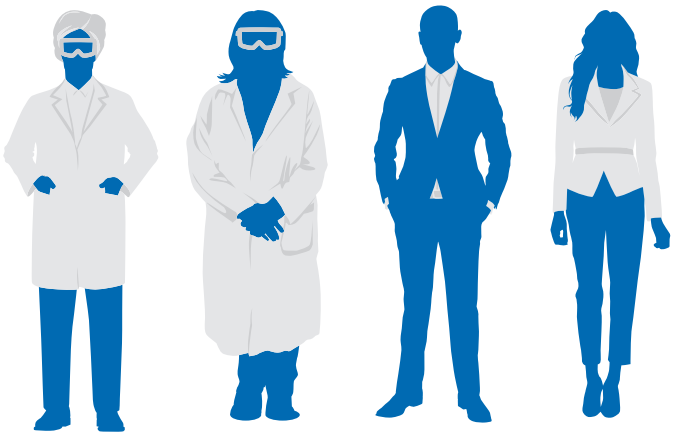
The greatest strength of Novartis is our people, whose diversity, energy and creativity are crucial to our success.

HEADCOUNT

129 924

NATIONALITIES

147



ANNUAL TRAINING HOURS PER EMPLOYEE

22.6

WOMEN IN MANAGEMENT

42%

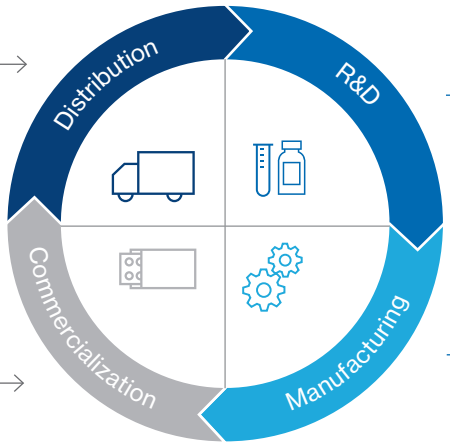
What we do

Our business model

RESOURCES WE USE

- Talented people
- Financial capital
- Intellectual capital
- Natural capital
- Technology
- Infrastructure & facilities

WHAT WE DO



THE VALUE WE CREATE

- Improved health and well-being for people
- Access to medicine and healthcare
- Shareholder returns
- Jobs
- Taxes paid

Our products and reach

We develop and produce innovative medicines to address patient needs in disease areas where our experience and knowledge have the potential to produce transformative treatments.

ONCOLOGY

RESPIRATORY

NEUROSCIENCE

CARDIOVASCULAR AND METABOLISM

IMMUNOLOGY HEPATOLOGY DERMATOLOGY

INFECTIOUS DISEASES

OPHTHALMOLOGY

We also offer about 1 000 generic medicines and biosimilars covering major therapeutic areas. They can bring substantial savings to patients and healthcare systems, and help improve access to healthcare.

PILLS

INJECTIONS

INHALERS

155
COUNTRIES
where Novartis products are sold

817 m
PATIENTS
reached in total

24 m
PATIENTS
reached through access programs

What we do

Our environment

We live in an era of amazing medical innovation, driven by better understanding of the genetic and biological roots of disease, and surging use of data analytics and digital technology in science and healthcare. At the same time, the world's population continues to grow and people are living longer, fueling a rise in chronic diseases. Together, these factors are increasing demand for high-quality care worldwide and pressuring healthcare systems to restrain spending growth.

ACCELERATING INNOVATION

49%

The rise in the average yearly number of new drugs approved in the US from 2014-2018, compared to 2009-2013

AGING POPULATION

1.4bn

The projected number of people in the world aged 60 or older by 2030, an increase of 46% from 2015

HEALTHCARE SPENDING

5.4%

The expected annual average growth in healthcare spending between 2018 and 2022

Our strategy

Our strategy is to build a leading, focused medicines company powered by advanced therapy platforms and data science.

STRATEGIC PRIORITIES

As we implement our strategy, we have five priorities to shape our future and help us continue to create value for our company, our shareholders and society.

Unleash the power of our people

We are transforming our culture to ensure people can fully apply their talent and energy. We're creating an organization where people are inspired, curious and unbossed.

Deliver transformative innovation

In our pursuit of transformative treatments, we challenge medical paradigms and explore possibilities to cure disease, intervene earlier in chronic illnesses, and find ways to dramatically improve quality of life.

Embrace operational excellence

We are rethinking how we work, embracing agile teams and building better productivity into our company to free resources that we can invest in innovation and help boost returns.

Go big on data and digital

We aim to spark a digital revolution at Novartis, embracing digital technologies, advanced analytics and artificial intelligence to help drive innovation and improve efficiency.

Build trust with society

We strive to build trust with society through our efforts to operate with high values and integrity, and to find new ways to expand patients' access to our treatments.

- → **Holding ourselves to the highest ethical standards**
- → **Being part of the solution on pricing and access**
- → **Addressing global health challenges**
- → **Being a responsible citizen**

I want nothing more than to create incredible innovations that reimagine medicine and then to get these medicines to the millions of people around the world who need them

Vas Narasimhan

Message from the CEO

Novartis has a clear purpose: to reimagine medicine to improve and extend people's lives. We use science and technology in an effort to create transformative treatments that can change the practice of medicine, and then strive to get them to the people who need them.

Society's trust is essential to accomplishing our goals. Since becoming CEO, I have made building trust with society a top priority. We aim to hold ourselves to the highest ethical standards, take bold steps to increase access to medicines, tackle complex global health challenges, and do our part as a responsible corporate citizen.

We still have plenty of work to do, but I'm proud of what we've achieved over the past year – both as a leading medical innovator and as a responsible contributor to society.

Leaders are key to establishing a culture of integrity, and we've made it clear to employees that we must never compromise our ethical standards in order to meet business targets. We've revised our employee bonus incentives to reinforce this.

In 2018, we took an important new step in our long history of expanding access to medicines. We adopted principles that put access at the heart of our business. We will integrate access strategies in all our new product launches to help ensure that our medical breakthroughs reach as many people as possible. This is the start of a journey, and our progress will be part of the annual performance reviews for me and my fellow Executive Committee members.

Our existing access programs also continue to progress. In 2018, Novartis Social Business reached almost 25 million patients with medicines and 7.9 million people with health education. I was pleased to see that our ongoing efforts to bring our innovations to patients around the world helped Novartis climb to second place on the Access to Medicine Index.

We've also made important progress in helping address key global health challenges. With nearly 900 million malaria treatments delivered at no profit since 2001, we renewed our commitment with a USD 100 million investment over five years to research and develop vital next-generation antimalarial drugs. Building on our long-term commitment to end leprosy, we helped found the Global Partnership for Zero Leprosy to finally eliminate this ancient disease. In addition, we have embarked on exciting new efforts targeting killers like Chagas and sickle cell disease.

Finally, we've taken steps to be a better corporate citizen. In September, we became the only pharmaceutical company to pledge support for the Equal Pay International Coalition. We endorsed the UN business standards against discrimination of lesbian, gay, bisexual, transgender and intersex people. And we established a new companywide environmental sustainability strategy, with the aspiration to become carbon neutral by 2025, and plastic and water neutral by 2030.

It has been my honor to lead our company through a challenging and inspiring year. We are proud of our progress and are firm in our resolve to continue earning society's trust.

Vas Narasimhan
Chief Executive Officer

Global Health & Corporate Responsibility at Novartis

Defining the Global Health & Corporate Responsibility priorities

Novartis recognizes society's increasing expectations of our industry and our company. In recent years, many aspects of our business model have been debated and questioned in public settings, including how we price our medicines, engage with physicians, and leverage intellectual property to protect our innovations. These are industry issues, but our own behavior has sometimes contributed to these perceptions, as we have lacked transparency and faced allegations of inappropriate behavior. We are committed to living up to stakeholder expectations as we endeavor to increase the positive social impact we have on patients, stakeholders, the communities in which we operate, and society at large.

Our purpose is to improve and extend people's lives. We aim to develop breakthrough therapies and deliver them to as many people as possible. Building trust with our stakeholders is critical to our ability to deliver on our purpose, as well as our long-term financial performance. We have a clear strategic path that we believe will further accelerate our journey to build trust with key stakeholders and society. Our Global Health & Corporate Responsibility (GH&CR) activities are centered around four key focus areas:

- Holding ourselves to the highest ethical standards
- Being part of the solution on pricing and access to medicines
- Helping tackle global health challenges
- Being a responsible citizen

We are committed to taking real, measurable and reportable action in these key areas, and making sure that we communicate about them clearly and transparently. We are also determined to learn from and share our experience.

Identifying our key issues

We conducted our third full corporate responsibility (CR) materiality assessment in 2017. The results identified four material CR issue clusters: access to healthcare, innovation, patient health and safety, and ethical business practices. Within these clusters, priority topics have been identified. These topics are at the core of the four GH&CR focus areas outlined above, and are covered in the following sections of this report. For more details, download the 2017 Corporate Responsibility Materiality Assessment.

Streamlining our governance

In 2018, we strengthened our efforts to further integrate access to healthcare across our portfolio. To better reflect this increased breadth and scope, the company changed the name of the function responsible for leading this work to Global Health & Corporate Responsibility.

The Governance, Nomination and Corporate Responsibilities Committee (GNCRC) of the Board of Directors continues to oversee the company's strategy and governance on GH&CR topics.

We simplified the other CR governance bodies from three to one. The new GH&CR leadership team includes representatives from the business divisions and relevant functions. The Group Head of Global Health & Corporate Responsibility continues to report to the CEO of Novartis. We believe this new leadership structure will help ensure alignment behind a comprehensive GH&CR strategy, enabling its smooth rollout and integration into the business and streamlining objectives and monitoring of impact.

The CEO and the other Executive Committee of Novartis (ECN) members have a simplified balanced scorecard in 2018 that will be used in calculating their compensation, which includes four strategic non-financial objectives, one of which is access to healthcare (see Item 6, p146 of the Novartis Annual Report 2018).

Engaging with key stakeholders

The GH&CR team, including Novartis Social Business and the Novartis Foundation, continues to engage with a wide range of stakeholders, including patients and caregivers, associates, healthcare providers, governmental and nongovernmental organizations, shareholders and other financial market participants, local communities, and partners from the pharmaceutical and other industries.

In September, we held an investor call focused on GH&CR priorities, and speakers included the Group General Counsel and the Group Head of GH&CR. In addition, we held a number of sustainability-focused calls with investors and investment groups, and we ran several sustainability-focused meetings during the year.

Highlights included hosting a two-day meeting of the Impact Valuation Advisory Council in October; a Novartis Social Business stakeholder dialogue held in Singapore in November; and a stakeholder event held in Basel in December, called "Reimagining Access: How to Make Innovation Accessible to More People in a Sustainable Way." Additionally, our CEO delivered a keynote address at the annual BSR Conference in New York in November, during which he presented the company's approach to building trust with society.

Novartis also strives to engage in constructive dialogue with policymakers and other external stakeholders, with the specific purpose of introducing our perspective into the policymaking process. Representing our perspective

and providing policymakers with data and insights enables informed decision-making conducive to improving patient outcomes. We also work closely with trade associations and participate in industry initiatives, which create opportunities to raise industry standards and exchange best practices. A list of our memberships can be found in the appendix on page 58.

Novartis makes financial contributions to support political dialogue on issues of relevance to the company or to certain government projects (e.g., for capacity-building). Such contributions need to be fully compliant with applicable regulations, and we only make political contributions in countries where such contributions by corporations are both legal and generally considered appropriate. We publish the amount of these contributions on our website and, for the US, in the Novartis in Society US report.

Measuring and valuing our impact

The Novartis financial, environmental and social (FES) impact valuation is our approach to measuring the social and environmental impact our business activities have on society, in addition to our economic value. We first developed, tested and applied our methodology in 2016.

Since then, we have further developed the approach, significantly expanding the scope. In 2017, this approach showed that our activities contributed USD 84 billion to the global gross domestic product (GDP), as well as an estimated 830 000 jobs beyond those held by our own employees. In addition, our human capital impact – including employee development, occupational safety and living wages – was valued at USD 7.0 billion, with USD 6.6 billion coming from the social impact of living wages in our own operations and the entire supply chain, and USD 0.4 billion coming from employee development and occupational safety. At the same time, we are taking steps to minimize our negative environmental impact, as measured by the carbon, other air emissions, water and waste impacts of our own operations and supply chain, which were valued at USD 4.7 billion. For the first time in 2017, we calculated the social impact of a large part of our Innovative Medicines portfolio in 29 countries, amounting to USD 72 billion.

Our impact valuation efforts are still evolving, with gaps to be filled in methodologies and data. In 2018, a number of Novartis case studies were published, aiming to address these gaps. For 2017, induced effects were added as additional air emissions and water impacts in the supply chain. The increased scope explains the change in results compared to 2016. For more details, see appendix page 59.

Novartis financial, environmental and social impact 2017

Indicator	Results[1]	Remarks
Financial		
GDP contribution	USD 84 bn	Own operations USD 48 bn, indirect impacts USD 19 bn, induced impacts USD 17 bn
Employment	830 000	Own operations 121 000, indirect 360 000, induced 470 000
Economic inefficiencies		Not valued in 2017; no methodology available
Total taxes		Not valued globally in 2017
Environmental		
Climate, energy and air pollution	(USD 3.8 bn)	Own operations USD 220 m, indirect USD 1.5 bn, induced USD 2.1 bn
Water and waste	(USD 900 m)	Own operations USD 48 m, indirect USD 283 m; induced USD 413 m, downstream USD 149 m
Other environmental impacts		Land use, biodiversity not valued in 2017
Social		
Living wages	USD 6.6 bn	Own operations USD 1 bn, indirect USD 5.6 bn
Employee development	USD 370 m	Own operations
Occupational safety	(USD 3 m)	Own operations including third-party personnel (field force not yet covered)
Other human capital impacts		Employee well-being, voluntary turnover, human rights beyond living wages not valued in 2017
Products	USD 72 bn	Large part of the Innovative Medicines portfolio in 29 countries

[1] All figures refer to 2017. 2018 data is not yet available.

Valuing the global impact of Novartis – Five questions to John Elkington

In 2018, Novartis convened a group of experts to form its Impact Valuation Advisory Council (IVAC), with the following goal: to road test and improve the company's approach to impact valuation, building momentum for wider adoption across its global business to guide business outcomes that can create financial, environmental and social value. John Elkington[1] is the chair of IVAC. Other members include Amanda Feldman (director, Impact Management Project), En Lee (partner and head of Asia-Pacific, LGT Impact), Jelena Spanjol, Ph.D. (head, Institute for Innovation Management, Munich School of Management), and Mathis Wackernagel, Ph.D. (founder and president, Global Footprint Network). The first IVAC meeting was held in Basel in October 2018.

You coined the term "triple bottom line" 25 years ago. Where are we now?

Understood as a sustainability framework that examines a company's social, environment and economic impact, my intention with the "triple bottom line" (TBL) was for it to be the basis of a world where people and planet were valued on par with profits. The concept has been widely adopted over the years, powerfully shaping ESG (environmental, social and governance) ratings, Global Reporting Initiative-style reporting, and the rapidly growing B Corporation movement.

But too often we see a trade-off mentality, where "shared value" is targeted across two bottom lines, at the expense of the third. In honesty, we still live in a world where the system deems profit and the financial bottom line as the bottom line, the single measure of company success.

That's why I proposed a "product recall" for the TBL in June 2018, through the Harvard Business Review. Tomorrow's impact will be measured using tomorrow's impact tools, hopefully including a rebooted TBL.

Why is impact valuation seen as increasingly important?

There is growing market awareness that impact valuation – the quantifying of impacts in monetary terms – can bring key social and environmental value into the equation. Challenges once seen as peripheral are becoming financially "material" – a trend illustrated by BlackRock CEO Larry Fink's call in 2018 for urgent progress in this area.

How is the impact valuation work of Novartis helping advance the field?

The work Novartis is doing in the space goes beyond what most companies aspire to. In addition to publishing data on its impacts, both positive and negative, Novartis is openly sharing its evolving impact valuation methodology through detailed case studies. That's a huge boost for the entire field.

What are the strengths and weaknesses of the company's approach?

This is a practical, bottom-up approach, prioritizing the development of key indicators for topics highlighted in the firm's CR materiality assessment.

The next challenge: to make the methodology both accessible to and applicable across more parts of the business. As challenges such as data granularity are overcome, the focus will expand to using impact valuation to drive and inform strategy and decision-making processes at Novartis.

What is the next step in impact valuation?

The widespread adoption of impact measurement and management has the potential to transform financial markets – where investors allocate capital toward companies that are eliminating negative impacts while creating positive impact.

The Impact Management Project, which aims to accelerate this shift (and is represented on the IVAC by Amanda Feldman), signals the next stage of the Impact Revolution. Corporate goals, performance and reporting are already increasingly being tested against more ambitious benchmarks, linked to the UN Sustainable Development Goals (and the World Benchmarking Alliance), Science-Based Targets or the Future-Fit Business Benchmark.

Even more importantly, new technology – including machine learning and artificial intelligence – will massively boost the utility of the data gathered.

Novartis could continue to contribute toward this global shift by engaging and leading by example.

[1] Author, advisor and entrepreneur; co-founder and executive chairman of Volans; and co-founder of SustainAbility

Indirect impacts in Switzerland
In Switzerland (Basel), where we are headquartered, Novartis offers jobs not only directly but also indirectly as a buyer of goods and services from suppliers, including many small- and medium-sized enterprises. In 2018, the company placed orders worth about CHF 2.4 billion with companies in the 26 Swiss cantons. Novartis indirectly secured more than 58 000 jobs in Switzerland through the procurement of products and services. Major areas of procurement include laboratory equipment, information technology products and services, raw materials, building costs, fixtures and fittings, and chemical products.

Contributing to the UN goals

We have a long-term commitment to support the United Nations in achieving its development goals, starting with the Millennium Development Goals and, since their adoption in 2015, the Sustainable Development Goals (SDGs). As a leading healthcare company, ensuring good health and well-being (goal 3) is at the core of our business and is aligned with our purpose of reimagining medicine to improve and extend people's lives. Through our business operations and ongoing activities, we make essential contributions to goal 8 (decent work and economic growth), goal 9 (innovation and infrastructure), and goal 13 (climate action). We harness the power of partnerships (goal 17) to discover and develop breakthrough treatments and deliver them to as many people as possible. In 2018, we made further commitments to help increase our contributions to goal 5 (gender equality), and we strengthened our environmental targets to further align with goal 6 (clean water and sanitation), goal 7 (affordable and clean energy), and goal 12 (responsible consumption).

As an original signatory of the UN Global Compact (UNGC), we are committed to sharing our progress in implementing the 10 principles of the compact. This report serves as our UNGC Communication on Progress. We will also publish a more detailed UNGC Index on our website in the first quarter of 2019.

A mapping of our activities against the SDGs and the UNGC principles can be found in the GRI Content Index on page 51 of this report.

The UN Sustainable Development Goals offer a compelling vision and a sound framework for a fairer world – one with improved long-term prospects for peace and growth. We believe stable and reliable healthcare systems are vital for economic and social progress, and Novartis remains a willing partner in these efforts

Joerg Reinhardt
Chairman of the Board of Directors

Photo Dr. Helen Yifter checks the blood pressure of Amina Shafi, 62, who has type 2 diabetes. Every three months, Ms. Shafi travels by bus to visit Dr. Yifter at Black Lion Hospital.

Photo Florencia Segal, a physician-researcher at Novartis in Cambridge, Massachusetts, consults with patient James Mulcahy at Brigham and Women's Hospital in Boston, where she volunteers one day a week.

STRATEGIC AREAS

Holding ourselves to the highest ethical standards

It is right for society to have high expectations toward companies when it comes to integrity and ethical behavior. At Novartis, we believe in transparency when it comes to fulfilling our commitment to uphold high ethical standards. We want to be open about where we are and what we still need to accomplish

Klaus Moosmayer
Chief Ethics, Risk and Compliance Officer

2018 highlights

- Rolled out a new principles-based Professional Practices Policy to guide our interactions with stakeholders, including healthcare professionals, healthcare organizations, patients and patient groups
- Experienced a 54% reduction in the number of reported complaints of fraud and professional practices in the sales force in 2018 versus 2017
- Launched a newly harmonized Risk Assessment and Monitoring Process
- Strengthened the Integrity & Compliance function and conducted 220 country visits
- Elevated the role of Chief Ethics, Risk and Compliance Officer to the Executive Committee of Novartis

Key challenges

- Addressing questions regarding our business practices and our involvement with Essential Consultants
- Standardizing the implementation of sales force fixed and variable pay across countries
- Managing risk across an organization of more than 125 000 people that sells products in 155 countries

Why is it important? If Novartis is to be a trusted leader in changing the practice of medicine, we need to be an institution that holds the respect and confidence of society. The pharmaceutical industry has lost much goodwill in recent years due to a variety of real or perceived ethical and legal lapses. We are committed to continuing to build trust with patients, physicians and other stakeholders; it is critical to delivering on our purpose as well as long-term financial performance. We always need to keep in mind our responsibility to society, and we aim to consistently meet its increasing expectations.

Our approach and performance

We care about our people, patients and customers, and commit to the highest ethical standards in what we do. As part of the company's cultural transformation, we are continuing to strengthen the tone from leaders, support constructive principles-based discussions, and improve the decision-making of our associates. This is a journey that we began several years ago, and over the past year, we have made further progress.

In late 2017, we announced a new principles-based policy on interactions with our stakeholders, including healthcare professionals, healthcare organizations, patients and patient groups: the Professional Practices Policy (P3). This officially came into force enterprise-wide on March 1, 2018, replacing the previous divisional compliance policies (with the exception of Alcon). P3 encourages ethical decision-making by helping our associates navigate areas of ambiguity by first asking themselves five simple questions, starting with whether they are putting patients first. We operate in a highly regulated industry, so guidance and rules still exist, but we believe this approach enables professional judgment across all activities, driving personal accountability for behaviors.

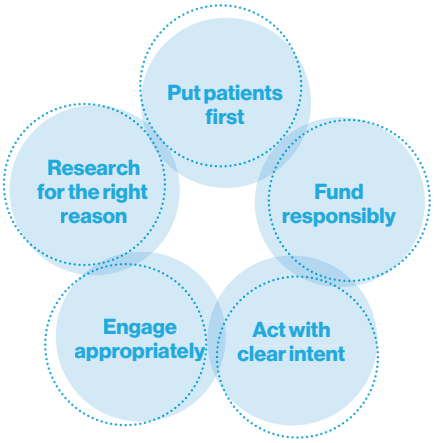
Since 2016, we have adjusted the ratio of fixed to variable total compensation for our sales force to help ensure that the target variable component is a maximum of 35% of total compensation, on average across all countries. To receive any form of variable compensation, each employee, including the sales force, must perform to a minimum standard with regard to our Values and Behaviors, which include acting with integrity. For our sales force, in particular, 20% of target variable pay is based on demonstration of our Values and Behaviors. We are in the process of implementing these standards in every country in which Novartis operates. Ultimately, no sales representative will receive the variable compensation unless he or she meets expectations with respect to our Values and Behaviors.

So far, the rollout of the new incentive system has shown positive results. Across divisions, there was a 54% reduction in the number of reported complaints of fraud and professional practices in the sales force in 2018 compared to 2017. Additionally, 223 complaints (88 of higher risk and 135 of lower risk) were investigated. Of these, 65% were substantiated misconduct allegations for 2018 (compared to 63% in 2017). A higher-risk complaint applies to a senior leader or manager, potentially disruptive reputational impact, sexual harassment, discrimination, retaliation and financial significance.

When hiring and promoting associates, we are also increasingly taking ethical competencies into account to help ensure that there are no known issues for a particular individual before he or she is brought into – or promoted within – the organization.

P3 PRINCIPLES

Novartis has adopted a single set of ethical principles that should be applied in daily decision-making by all Novartis associates



54%

Reduction in the number of reported complaints of fraud and professional practices in the sales force in 2018 vs. 2017

In 2018, we combined our risk management and compliance functions into a single organizational umbrella to provide the businesses with a better view of the risks we face as an organization, and how those risks could impact our ability to deliver on strategic priorities. This is expected to enable more effective risk management and mitigation efforts. We created the role of Chief Ethics, Risk and Compliance Officer to head the combined organization, and elevated this role to the Executive Committee of Novartis (ECN). In addition, the Chief Ethics Risk and Compliance Officer presents bi-annually to the Audit and Compliance Committee (ACC), and is free to request a closed session with the ACC and/or its Chair as needed. The Chief Ethics Risk and Compliance Officer also is a permanent attendee to the Risk Committee, and plays an active role with the Chair of that committee in shaping the Board agenda regarding risk.

In 2018, we launched our newly harmonized Risk Assessment and Monitoring (RAM) process within the Integrity & Compliance (I&C) function. This will enable us to have a more targeted approach to monitoring and auditing by focusing on key countries and activities where outliers have been detected, and aiming to prevent misconduct before it transpires. We started this journey in 2017 by working to consolidate the data available across Novartis, and in 2018, we launched an enhanced version of our I&C risk assessment dashboard, incorporating country risks and mitigation and monitoring plans in one central place. From 2019 onward, we will further develop our companywide enterprise risk management process to ensure that we move to a single and integrated risk approach throughout Novartis, fully supported by online tools and data analytics. The harmonization of this process is another example of simplification, helping our local teams identify and manage risk effectively.

We are also using digital technology to help bring ethical standards closer to our associates on a daily basis. We have developed an ethics app that consolidates our global integrity and compliance information, which is then available for download onto associates' mobile devices wherever they are.

To help monitor and enforce our integrity standards, we have continued to build our I&C function, adding more than 100 people in recent years. The expanded team has increased the number of country visits to share learnings from across the organization, reaching about 220 in 2018. We also continue to invest in training for our associates, with

NEW RISK ASSESSMENT AND MONITORING PROCESS LAUNCHED

In 2018, we launched a newly harmonized RAM process that will enable a more targeted approach

Ethical business practices performance indicators

	2018	2017	2016
Novartis associates trained and certified on the Code of Conduct[1]	**116 884**	114 913	110 774
Misconduct cases reported/allegations substantiated[2]	**951 / 618**	2 086 / 1 571	1807/1343
BPO allegations per category (%)[3]			
Fraud	**51**	50	46
Professional practices	**31**	29	36
Employee relations	**36**	32	27
Conflict of interest	**10**	6	6
Information protection	**4**	5	3
Quality assurance	**6**	7	6
Research and development	**1**	2	2
Other	**8**	8	8
Dismissals and resignations related to misconduct[4]	**311**	803	669

[1] Active Novartis associates with email addresses, trained via e-learning
[2] The number of misconduct cases reported may change, as matters may be reassessed in the course of the case lifecycle. The number of substantiated allegations may change due to the fact that investigation reports with assessments are received on an ongoing basis, which potentially leads to a difference in numbers at a later stage.
[3] One case can fall under several categories, so the total is greater than 100% and category figures total more than the stated number of cases. Investigation reports are received on an ongoing basis, which potentially leads to a reassessment of the allegation category and related figures.
[4] The number of dismissals and resignations related to misconduct may change due to the fact that investigation reports are received and then reviewed for remedial actions on an ongoing basis, which potentially leads to a difference in numbers at a later stage.

high completion rates for our Code of Conduct training (98%), our P3 training (99%), as well as our anti-bribery course (91% after three months[1]).

We are already seeing early indications that our efforts are starting to pay off. For instance, in the last two years, we have seen a positive trend in "generally effective" internal compliance audits. Additionally, our whistleblower hotline continues to receive reports of suspected cases where employees may have failed to follow our ethical guidelines. While the proportion of substantiated allegations related to ethics and compliance matters remains stable (56% in 2018 compared to 55% in 2017), the number of reports received and the number of subsequently substantiated allegations have decreased. This overall decrease is attributed, in part, to a significant decrease in fraud cases in China and in employee relations cases in Alcon US and Innovative Medicines. At the same time, there has been an overall significant decrease in Alcon cases in general. We have also been undertaking a stricter initial assessment of incoming complaints than in the past, which has resulted in an increasing number of performance issues and minor policy violations being handled locally (+22% compared to 2017).

In 2018, the Business Practices Office (BPO) investigated 951 cases (454 of higher risk and 497 of lower risk) relating to misconduct, covering 1 388 allegations. Out of these, 618 allegations (306 of higher risk and 312 of lower risk) were substantiated and resulted in 311 dismissals or resignations (157 for higher risk and 154 for lower risk).

However, the year was not without its challenges. Following the issue with Essential Consultants, when our political consultancy practices came into question, we took steps to improve oversight and help prevent similar matters in the future. We have strengthened the relevant contracting and due diligence processes; before Novartis engages political consultants, for example, we will secure an independent third-party due diligence report.

As an organization of more than 125 000 people that sells products in 155 countries around the world, we face a certain amount of risk. We will continue to increase our ability to manage risk and strengthen our three lines of defense. The first is associates engaging in principles-based decision-making and acting in every situation with strong ethics and integrity; the second is our Ethics, Risk and Compliance (ERC) function, strengthened in 2018. As of January 1, 2019, we have further strengthened the effectiveness of our third line of defense by bringing together Internal Audit, the BPO Office and Global Security (all complementary teams) into a new function called Novartis Business Assurance & Advisory (NBAA).

NBAA aims to provide a safe place for associates to speak up, drive fair and timely investigations, deliver value-adding audits and advisory engagements, and be an enabler of our culture. The BPO Office, renamed the SpeakUp Office, has been simplified. It continues to be a place where anyone can safely raise concerns about unethical behavior at Novartis. However, as of January 2019, it is focusing on significant cases while empowering local organizations to handle minor and day-to-day concerns to enable faster resolution. Global Security will be able to work even closer with the SpeakUp Office by investigating higher-risk cases while continuing to provide world-class protection for Novartis associates, patients, assets, brands and reputation. We expect these changes will improve how we manage risk at Novartis.

Commitment to transparency and disclosure

For many years, transparent reporting and disclosure has been a central part of our commitment to doing business responsibly. As the transparency landscape rapidly evolves, Novartis is keeping pace with developments and is committed to meeting new transparency requirements. We publish the Novartis in Society report (formerly our Corporate Responsibility Report) annually, and we will continue to publish the US Transparency and Patient Access Report, now renamed the Novartis in Society US report, on an annual basis.

98%

Completion rate for Code of Conduct training

99%

Completion rate for P3 training

91%

Completion rate for anti-bribery course, after three months

[1] In 2018, our anti-bribery training campaign was launched in October. Final measurement will be available in May 2019.

Today, we disclose payments and other transfers of value made to healthcare professionals and organizations in Europe, in line with the European Federation of Pharmaceutical Industries and Associations (EFPIA) Disclosure Code and the MedTech Europe Code of Ethical Business Practice. We also encourage healthcare professionals to consent to individual disclosure as part of their commitment to medical integrity. Additionally, we disclose spend within the scope of transparency codes in Australia, Canada (voluntary disclosure), Israel, Japan and the US. These approximately 40 local reports are available on our website. We are working now to report in line with requirements in Saudi Arabia, South Korea, Indonesia, Brazil and Colombia. We are also working to implement appropriate internal processes and systems to disclose our numbers as regulations and the industry evolve.

Novartis also discloses monetary and non-monetary support to patient organizations around the globe by June 30 every year, in compliance with the Code of Practice on Relationships between the Pharmaceutical Industry and Patient Organizations set by the EFPIA. These payments are also available on our website.

We fully support the publication of clinical study results. Our policy is to not withhold, veto or suppress data. We make every effort to comply with national and international standards for disclosure of clinical trial information, and we are committed to the timely disclosure of the design and results of all interventional clinical studies for innovative treatments in patients. Results are made publicly available, regardless of their outcome.

For more details, visit our website.
Ethics, risk and compliance

Photo Physician-researcher Florencia Segal sits with patient James Mulcahy at Brigham and Women's Hospital in Boston.

Photo This "ambulance" i s unique to the north of Rwanda. Community volunteers connected to the Poste de Sante Boyange carry patients through the rugged landscape to the rural health clinic.

STRATEGIC AREAS

Being part of the solution on pricing and access

Although we face a long and challenging road to meet the UN goal of universal health coverage, I see a young generation, armed with unprecedented technological power and mobility, who refuses to believe that the access-to-healthcare challenges cannot be solved

Patrice Matchaba
Group Head, Global Health & Corporate Responsibility

2018 highlights

- Ranked second in the Access to Medicine Index, up from third in 2016
- Began implementing the Novartis Access Principles
- Reached almost 25 million patients with medicines and nearly 8 million people with health education through Novartis Social Business
- Accelerated the launch of local brands, reaching more than 220 000 patients
- Provided USD 1.9 billion in free medicines to more than 68 000 patients through the Novartis Patient Assistance Foundation in the US
- Obtained positive results for the Novartis Foundation ComHIP program; hypertension control rates for monitored patients improved from 36% to 71% over 12 months
- Decided to stop filing patent applications in nine LMICs, starting in 2019

Key challenges

- Consistently and rapidly implementing the Access Principles across Novartis
- Finding innovative financing solutions for cell and gene therapies for rare diseases, reflecting their value to patients and society while taking the realities of healthcare budgets into account
- Driving sales volume for Novartis Social Business programs to help ensure the programs are sustainable

Why is it important? Through our core business, we help prevent and treat diseases, ease suffering and improve quality of life for people worldwide. However, as the size and complexity of the world's healthcare challenges grow, we must widen our scope and extend our impact even further. It begins with a fundamental shift in the way we do business – with the clear intention of bridging the divide between those with access to critical healthcare innovations, and those without.

Our approach and performance

Our medications reach more than 800 million people worldwide every year, but billions more still lack access to essential medicines and healthcare. As a significant part of our portfolio is innovative, first-in-class therapies, it is our responsibility to ensure these medicines are accessible to the patients who need them, irrespective of where they live. For this reason, we are making a fundamental shift in the way we do business and are reimagining how to expand access to critical healthcare innovations. The Access to Medicine Foundation recognized our efforts in this area by ranking us second in the 2018 Access to Medicine Index, up from third position in 2016.

In late 2017, we established the Novartis Access Principles and embarked on a journey to systematically integrate access into our business model. The Access Principles are built on three pillars: research and development (R&D), affordability and strengthening healthcare systems. At their core is the commitment that, for all our new medicines, we will systematically integrate access strategies into how we research, develop and deliver them globally.

These strategies include adopting innovative pricing and access models, refocusing research and development based on society's healthcare needs, and supporting approaches to strengthen healthcare systems.

We made significant progress in setting up our internal systems and training our teams on our new business standards. We are taking steps to establish relevant key performance indicators to continually measure our progress. Access will be a key measure of success for our leaders and employees, and we will be transparent in sharing our successes and our learnings.

Assessing our R&D portfolio against unmet needs

As we research and develop new drugs, we systematically assess our product portfolio against the unmet needs of underserved populations and will integrate these needs, as appropriate, into our drug discovery and development strategy.

The Novartis Working Group for adaptive R&D, initiated in 2016, spans our innovative, established and generic medicines groups and aims to evaluate and execute adaptive development initiatives that deliver incremental benefits to vulnerable patient populations. Three main areas are considered: development of new formulations, expansion of the clinical use of existing medicines into new indications and populations (e.g., pediatric populations), and research to better understand issues of relevance for adaptive development (e.g., genetic polymorphisms).

In the first review cycle across all development units, 14 project proposals were endorsed to move forward. They include a new child-friendly formulation of hydroxyurea for sickle cell disease; the use of *Entresto* in heart failure related to Chagas disease; a project to identify potential differences in the pharmacokinetics of drugs in African patients, where such data is lacking; and the creation of a new *Coartem* formulation to treat malaria in infants below 5 kilograms of body weight. In addition, we

No. 2

In the 2018 Access to Medicine Index, up from third position in 2016

NOVARTIS ACCESS PRINCIPLES

R&D: We systematically assess our product portfolio against the unmet needs of underserved populations and integrate these needs, as appropriate, into our drug discovery and development strategy

Affordability: We work to make our medicines available by considering both effective affordability strategies and innovative solutions to disease management

Systems strengthening: We seek opportunities to lower local barriers to healthcare delivery, working in collaboration with governments and other partners to support quality patient care in areas where we can have the greatest impact

joined forces with the Global Antibiotic Research & Development Partnership to accelerate the development and availability of generic antibiotic treatments for children in low- and middle-income countries.

Developing effective affordability strategies

We are working to make our medicines available by considering both effective affordability strategies and innovative solutions to disease management, as well as off-patent solutions, to complement our portfolio.

We are working to ensure that we price our medicines responsibly, based on the value they deliver to patients, healthcare systems and society.

In the US, we recently implemented guidelines for limiting average net price increases across our portfolio to the healthcare inflation rate, and we publish average price increases annually in the Novartis in Society US report. We also proceeded to proactively adjust prices downward in several low- and lower-middle-income countries. We will continue monitoring our prices and take relevant action where needed.

Novartis was one of the first companies to enter into value-based contracting for our medicines. While still at the early stages of this approach and learning from our experience, we already have multiple agreements in place whereby payments are linked to the outcomes delivered by our medicines (for example, our innovative heart failure medicine *Entresto*).

For *Kymriah*, our breakthrough treatment for certain types of cancers, we have developed a novel outcome-based contract for the indication of B-cell acute lymphoblastic leukemia, and have begun implementing agreements within the network of certified *Kymriah* treatment centers. Under the agreement, Novartis does not charge participating treatment centers for the cost of *Kymriah* when a patient does not achieve a response (as defined by the FDA label) within one month following infusion.

In 2018, the ECN reviewed plans for key brands in the launch phase to assess access strategies targeting underserved populations. For example, *Aimovig*, our innovative medicine for the treatment of migraine, is supported by programs designed to help accelerate access both before and after reimbursement, as well as to speed up introduction and access in low- and middle-income countries (LMICs). We are also co-creating employer-based access schemes in selected markets, including Russia and Mexico.

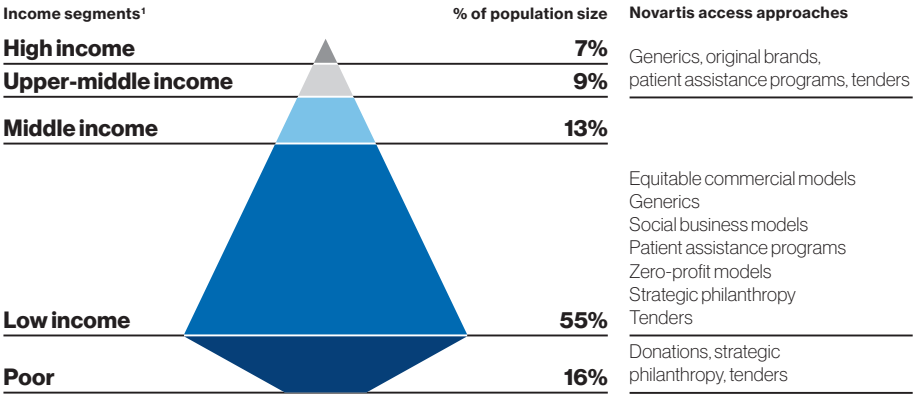
Our Sandoz Division drives access through the provision of quality generic medicines. It focuses increasingly on segments where it can make a real difference, either by making available the most competitive generic alternative or by offering a novel and more affordable alternative to existing therapies (e.g., leading biologic medicines through its global biosimilar business).

14

Adaptive development project proposals were endorsed to move to implementation

NOVARTIS ACCESS FRAMEWORK

Our access framework can be adapted to the needs of people across income segments



[1] PEW Research Center with data from World Bank PovcalNet (data 2011)

LOCAL BRANDS

We take local affordability into account when pricing our medicines. In LMICs, for instance, we have introduced more affordable local brands of many innovative therapies. These improve affordability by lowering the out-of-pocket burden for patients in these countries and help address the time lag between the launch of innovative medicines in developed Western markets and in developing countries. Prices are set to address affordability challenges, taking into consideration socio-economic factors such as a country's gross domestic product per capita. By systematically integrating and optimizing our launch process, we are now able to introduce new medicines to LMICs in less than 12 months from approval in Europe or the US.

Local brands have launched for the following products: *Exforge* (chronic heart failure with reduced ejection fraction), *Ultibro* (chronic obstructive pulmonary disease), *Xolair* (asthma), *Gilenya* (multiple sclerosis), *Galvus* (diabetes), *Cosentyx* (psoriasis), *Lucentis* (wet age-related macular degeneration), *Exjade* (iron overload), *Kisqali* (metastatic breast cancer), *Zykadia* (non-small cell lung cancer), *Jadenu* (iron overload), and *Farydak* (multiple myeloma). *Aimovig* (migraine) is included in future plans.

Overall, we have launched over 60 local brands across more than 30 developing markets, reaching more than 220 000 additional patients to date. We are currently intensifying efforts to enable more patients to receive novel treatments, with plans to further expand these strategies and introduce around 50 additional local brands by 2020.

NOVARTIS SOCIAL BUSINESS

Established in 2016, Novartis Social Business (NSB) supports global public health through novel sustainable business models that enable access to high-quality medicines against infectious and chronic diseases in lower-income countries. In 2018, NSB reached almost 25 million patients with medicines and 7.9 million people with health education.

NSB comprises several legacy programs (Novartis Access, the Novartis Malaria Initiative and Novartis Healthy Family), supported by digital-enabling platforms. In January 2018, NSB assumed full responsibility for the entire Novartis product range in six countries in Africa and Asia (Malawi, Rwanda, Tanzania, Uganda, Laos and Cambodia), and it is now also leading the Sandoz business in Burundi, Kenya and India. These countries were selected because they are large enough for social business models to scale up and be sustainable over time.

In countries under NSB responsibility, we are exploring a new approach. In conjunction with health authorities, we are currently aligning our product portfolio with healthcare needs, with a view to launch in 2019 a tiered pricing (and packaging) strategy based on household wealth, and specific distribution channels. We plan to adapt this tiered-pricing model over time as we implement it in more countries.

Our goal is that, regardless of income, all patients in these countries will have full access to the range of products they need, across public and private channels, at prices they can afford. This is an important step toward achieving universal health coverage.

220 000+

Patients reached through local brands in more than 30 developing markets

For more details, read the **2018 Novartis Social Business report**

Local brands performance indicators

	Patients reached (thousands)		
	2018	2017	2016
Local brands			
Novartis Pharmaceuticals	**213.3**	99.1	20.6
Novartis Oncology	**8.0**	6.5	NA

In addition to addressing affordability issues, NSB delivers health system strengthening programs, several of which use digital technology to facilitate delivery.

NOVARTIS ACCESS

We continue to expand the Novartis Access program. Launched in 2015, Novartis Access offers a portfolio of 15 on- and off-patent medicines addressing key noncommunicable diseases: cardiovascular diseases, type 2 diabetes, respiratory illnesses and breast cancer. This basket of medicines is offered to governments, nongovernmental organizations (NGOs) and other institutional customers at a price of USD 1 per treatment, per month. The program also includes capacity-building activities to strengthen healthcare systems in lower-income countries.

Progress continued in 2018. The program delivered almost 2.3 million monthly treatments to five countries (Cameroon, Ethiopia, Kenya, Rwanda and Uganda). Further, we signed agreements for implementation in Colombia, El Salvador, Pakistan and Nigeria. Our objective remains to roll out the program in 30 countries in the coming years.

Over the past few years, we have also learned a great deal about the challenge of delivering a portfolio of medicines in many markets. Procurement processes that were built for single molecules are not easily amended to fit a portfolio approach. This has meant creating tailored solutions by country. We continue to learn and to apply these learnings to enhance the program for the future.

NOVARTIS HEALTHY FAMILY

The Novartis Healthy Family programs are innovative business models that are expanding access to community education, improved infrastructure and affordable healthcare products for people living at the base of the income pyramid – in a way that is sustainable. Programs are active in India (Arogya Parivar), Kenya (Familia Nawiri), and Vietnam (Cùng Sông Khòe). In 2018, the Novartis Healthy Family programs reached 7.8 million people through education, and more than 700 000 patients. Over the next five years, we plan to expand Arogya Parivar to more states in India, and make broader use of digital solutions to reach an expected 15 million people. In addition, we plan to roll out new Healthy Family programs in two additional countries in Africa in 2019.

QUANTIFYING THE AFFORDABILITY GAP

Even when medicines are available in low- and middle-income countries, many patients may not take their medicines as prescribed, if at all, due to cost. This is because out-of-pocket expenditure on health is particularly high in many emerging markets.

For example, the baseline study conducted by Boston University to evaluate the impact of Novartis Access in Kenya

1.5m

Patients reached through Novartis Access in 2018

7.8m

People reached with health education through our Healthy Family programs in 2018

Novartis social business performance indicators

	Patients reached (thousands)			Value USD (millions)			FTEs [1]			People reached (thousands) [2]		
	2018	2017	2016	**2018**	2017	2016	**2018**	2017	2016	**2018**	2017	2016
Social business models							**651**	555	535			
Novartis Access	**1 542.9**[3]	386.5	8.4									
Novartis Healthy Family	**720.8**	579.6	428.7							**7 804.6**	7 689.9	7 717.8
Novartis Malaria Initiative/*Coartem*	**20 778.0**[4]	33 441.8	48 939.2									

[1] Full-time equivalent positions and contractors
[2] Via training and service delivery and through health awareness activities
[3] The patient number was calculated based on treatments delivered and the following elements: daily treatment doses, treatment duration, treatment adherence and potential treatment overlap (as it is common for chronic patients to take several drugs). The treatment adherence and treatment overlap factors are based on assumptions from developed markets and will be revisited when we gain additional insights from Novartis Access rollout countries.
[4] Our patient reach has steadily declined over the past five years, due to the increasing availability of WHO prequalified generic ACTs, eligible for international donor-funded procurement. In addition, to harmonize the patient reach calculation methodology across Novartis, the malaria patient reach calculation was revised. We no longer consider a time lag between treatment shipment and patient reached. The calculation for malaria is now based on the treatments shipped in the respective calendar year.

showed that among patients who had medicines, the poorest actually paid the most for them. This seems to be partly because the poorest people are located on "medicine islands," where a lack of local competition leads to higher prices, and traveling to outlets where prices are lower is difficult. Our strategies and programs could have a substantial impact on equity by targeting remote communities with low-cost medicines.

In addition, teams in our Innovative Medicines Division are leveraging technology to better understand intra-country affordability challenges in LMICs. They have developed tools using curated data from publicly available sources such as the World Bank and Euromonitor (e.g., household disposable income), and inputs such as product prices, percent of household income allocated to healthcare, intermediary markups, payer mix and reimbursement levels. With these tools, the teams are able to better understand the affordability gaps at the household level (from the lowest- to highest-earning households) and assess which access solutions to use to help enable more patients to gain access to the medicines they need.

PATIENT ASSISTANCE PROGRAMS

Patient assistance programs play a crucial role in helping individuals gain access to healthcare when they are unable to afford it, even in countries with sufficient incomes and insurance schemes to help pay for healthcare. Having prescription drug coverage does not always guarantee that someone can afford the medicine they need, when they need it.

In the US, the Novartis Patient Assistance Foundation Inc. (NPAF) provides medicines at no cost to eligible US patients who are experiencing financial hardship and have limited or no prescription drug coverage. The number of patients needing help has continued to increase; in 2018, the foundation provided more than USD 1.9 billion in free medicines to more than 68 000 patients in the US, covering more than 65 medicines from our portfolio. Over the past five years, free medication valued at roughly USD 5.8 billion has been provided to around 273 000 patients.

We continue to look for opportunities to improve the efficiency of NPAF programs, using innovative technology solutions to enhance the patient's journey. Improvements such as automation in the income check process and the use of e-signatures enable patients to move through the required application process more quickly and easily, speeding up their onboarding into the program and helping them get the medicines they urgently need.

We also realized that in certain indigent areas of the US, there are opportunities for NPAF to partner with others – for instance, with the NGO Direct Relief to provide bulk retail pharmaceutical medications to a network of qualified institutions that handle the enrollment and processing of individual medication orders. As Direct Relief supports various safety net clinics, this more efficient system allows patients to walk in and receive the medicines they need almost immediately, filling a critical gap in the system.

Through Novartis Oncology Access programs in developing markets – specifically Asia-Pacific, Latin America and the Middle East – Novartis makes medicines from its oncology portfolio, including *Glivec*, *Tasigna* and *Exjade*, available through copay and shared contribution equitable pricing models.

1.9bn

In free medicines provided through the Novartis Patient Assistance Foundation Inc. to more than 68 000 patients in the US, covering more than 65 medicines from our portfolio (USD)

Patient assistance programs performance indicators

	Patients reached (thousands)			Value USD (millions) [1]		
	2018	2017	2016	**2018**	2017	2016
Patient assistance programs						
Novartis Patient Assistance Foundation Inc. (US)	**68.1**	55.5	51.2	**1 969.4**	1 466.4	1 115.0
Novartis Oncology Access	**71.1**	82.9	83.3	**1 310.9**	1 571.1	1 579.1

[1] Wholesale acquisition cost (WAC) plus logistics costs for some programs

DONATIONS

Donations remain an important tool in certain situations, such as disaster relief efforts, and help address outbreaks and neglected diseases, which mainly affect poor populations. Since 1999, Novartis has provided high-quality multidrug therapy (MDT) free of charge to all leprosy patients in the world through the World Health Organization (WHO), reaching more than 7 million people. In 2015, Novartis renewed its pledge with the WHO to work to end leprosy by extending its donation through 2020; the program extension is expected to reach an estimated 1.3 million patients. Treating patients with leprosy is one of the key strategies to eliminate the disease, as successfully treated patients no longer transmit the infection.

Novartis has also been donating *Egaten* (triclabendazole) to the WHO for the treatment of fascioliasis, or liver fluke, for over a decade. In 2018, our agreement with the WHO was renewed until 2022. Fascioliasis infects more than 2.4 million people globally.

While the WHO supplies *Egaten* during epidemic outbreaks and for periodic prophylactic use in endemic countries, it has been urging endemic countries to pursue drug registration to facilitate drug import and ensure sufficient and prompt availability when needed. However, health authorities in many affected countries require approval from a reference health authority, such as the FDA, prior to approval locally. As *Egaten* is not approved in the US, Novartis is working to register an innovative clinical package leveraging real-world evidence to support a New Drug Application submission.

CMLPath to Care™ is a unique global initiative that connects people living with chronic myeloid leukemia (CML) and their carers with effective treatments, professional medical capabilities, trained physicians and hands-on support. The initiative is directed by The Max Foundation, with support from Novartis through drug donations and funding. CMLPath to Care™ is an evolution of the agreement between The Max Foundation and Novartis Oncology for the original *Glivec* International Patient Assistance Program (GIPAP), which began in 2002.

The transition of GIPAP to CMLPath to Care™, which started in 2017, continued in 2018, with 68 countries formally transferred to The Max Foundation by year-end. The final six countries will be transferred in 2019. Novartis has committed USD 29 million from 2017 to 2021 in the form of financial support and 150 million tablets to cover treatment for approximately 36 000 patients. The donation program will make *Glivec* and *Tasigna* (both life-saving treatments) available to patients and help expand access, particularly for *Tasigna*.

Our generics division, Sandoz, renewed its partnership with World Child Cancer, a global charity that aims to improve timely diagnosis and access to treatment for children suffering from cancer in the developing world. The collaboration focuses on four developing countries: the Philippines, Ghana, Mexico and Myanmar. The charity currently reaches 5 600 children worldwide each year and aims to double that to 10 000 over the next five years. Sandoz began its partnership with World Child Cancer in 2016; to date, 2 468 children have

150m

Tablets to cover treatment for approximately 36 000 patients with chronic myeloid leukemia provided to CMLPath to Care™, directed by the Max Foundation, until 2021

Donations performance indicators

	Patients reached (thousands)			Value USD (millions) [1]		
	2018	2017	2016	**2018**	2017	2016
Donations						
Alcon medical missions [2]	**414.0**	391.9	484.0	**58.9**	61.2	73.0
Leprosy (WHO)	**176.2**	227.0	290.0	**5.2**	6.5	4.4
Fascioliasis/*Egaten* [3]	**294.0**	281.0	276.2	**2.9**	3.9	<1
CMLPath to Care™	**14.4**	NA	NA	**366.1**	NA	NA
World Child Cancer				**0.1**	NA	NA
Medicine donations (emergency relief)				**4.7**	10.9	1.8

[1] Wholesale acquisition cost (WAC) plus logistics costs for some programs
[2] Retail value for surgical products
[3] Manufacturing, testing and FTE costs

been diagnosed in the four countries, and 2 791 healthcare professionals have received training, enabling them to provide better care for young cancer patients and their families.

Sandoz also works directly with Americares, a leading health-focused relief and development organization that aids people affected by poverty and disaster. It provides long-term assistance in five healthcare areas: maternal, newborn and child health; infectious diseases; health system strengthening; mental health; and hypertension and diabetes. Americares notifies Sandoz of products required, based on the healthcare needs of countries and partners. To date, Sandoz has provided more than USD 9 million worth of products to Americares.

Our donations go beyond medicines. Alcon, our eye care division, announced in May the Alcon Cares Project 100, which aims to reduce cataract blindness by providing equipment to perform cataract surgery. Alcon Cares, a foundation that oversees equipment and product donations to those in need, will give 100 reprocessed *Infiniti* units to eligible clinics in Asia, Central and South America, and Africa over the next three years, making it one of the largest eye care equipment donations of its kind.

Strengthening healthcare systems for maximum impact

A treatment is only as good as the system that delivers it. We therefore seek opportunities to lower local barriers to healthcare delivery, working in collaboration with governments and other partners to support quality patient care in areas where we can have the greatest impact.

BUILDING CLINICAL TRIAL CAPACITY

In the field of clinical trials, we are working to expand the capacity of sites for global trials of our novel antimalarial agents, in partnership with Medicines for Malaria Venture and the Wellcome Trust. Activities include Good Clinical Practice training and evaluation, drug supply handling, data collection and integrity, and qualification of local testing labs (including training of microscopists for parasite counts). These efforts also involve community outreach efforts for patient recruitment.

INSPIRING THE NEXT GENERATION OF SCIENTISTS

Most medical research is currently conducted in developed countries, yet most of the world's population lives in the developing world. While opportunities for young scientists abound in the Western world, the scientific research scene in Africa, Asia and Latin America looks very different. In addition, the number of researchers in these countries is disproportionately low relative to the high burden of disease, while up to 70% of scientists emigrate from their native countries to seek education and employment elsewhere.

To help enhance professional development for scientists in LMICs, Novartis and the University of Basel developed a novel fellowship training program called Next Generation Scientist (NGS). Launched in 2011, NGS invites talented young scientists and clinicians from these countries to our Basel, Switzerland, campus for a three-month research internship. Participants are offered individualized mentoring, and engage in research activities tailored to their unique needs.

The program was evaluated, and the results were published in a research paper in BMC Medical Education. The results showed strong evidence of knowledge and skills transfer. There was a high retention rate of fellows in their home countries (more than 75%), with over 60% being employed in the public or academic sector.

In 2018, we welcomed a new group of 20 top students from 14 institutions in 11 emerging countries. NGS is a two-way relationship that benefits everyone involved. It improves our understanding of global healthcare challenges while providing young scientists with skills, knowledge, tools and inspiration to improve healthcare in their communities. Overall, more than 140 scientists and clinicians from 25 countries have participated in the program.

9m

Worth of products provided by Sandoz to Americares to date (USD)

140

Scientists and clinicians from 25 countries have participated in our Next Generation Scientist program since launch

TACKLING CARDIOVASCULAR HEALTH IN LOW-INCOME SETTINGS

The Novartis Foundation is a philanthropic organization working with multisector partners on innovative initiatives that can have a transformational and sustainable impact on health in low-income communities. The foundation has sharpened its focus and streamlined its portfolio in recent years, focusing on two key areas: accelerating leprosy elimination and addressing cardiovascular disease. Its philanthropic and programmatic work reached over 9 million people in 2018, an increase of over 30% versus 2017.

The foundation has two hypertension programs – Communities for Healthy Hearts (CH2) in Ho Chi Minh City, Vietnam, and the Community-Based Hypertension Improvement Project (ComHIP) in Ghana – that are working to bring hypertension detection and management closer to local communities by maximizing screening and education opportunities through blood pressure checkpoints in local shops, pharmacies and other businesses.

We evaluated ComHIP with respect to its effectiveness in detecting, diagnosing and treating hypertension early. The results, released in September, showed that the innovative ComHIP model improved community health by bringing screening and management services closer to where people live, work and shop. This proved tremendously helpful in accelerating hypertension diagnosis and improving patient outcomes; hypertension control rates for patients who were monitored for 12 months rose from 36% to 71%. The positive results of the ComHIP model are contributing to policy change, as Ghana health authorities are working to scale the program to additional regions, and integrate the ComHIP training curriculum and treatment guidelines into the national system.

The CH2 program is designed to improve healthcare provision for adults living with hypertension in four districts and 16 wards within Ho Chi Minh City. To date, CH2 has developed a communications strategy to increase hypertension awareness, and more than 500 blood pressure checkpoints have been set up. In October, the Ministry of Health in Vietnam included the Novartis Foundation in a policy dialogue to review Vietnam's progress in addressing cardiovascular diseases. The CH2 training curriculum and treatment guidelines will be integrated into the primary care-level improvement guidelines, and learnings from CH2 provided recommendations for strengthening policies that will enable effective interventions in the country.

Better Hearts Better Cities is an urban health initiative through which the foundation works together with governments, private sector partners and local communities work to improve cardiovascular health in urban populations.

In 2018, Better Hearts Better Cities covered 1.3 million people across three cities on three continents: Ulaanbaatar in Mongolia, Dakar in Senegal, and São Paulo in Brazil. As with ComHIP and CH2, the ultimate goal for Better Hearts Better Cities is to identify and validate a scalable approach that is sustainable and replicable in other cities and for other chronic diseases.

In October, the Novartis Foundation and the Syngenta Foundation for Sustainable Agriculture announced a partnership to address one of the root causes of cardiovascular disease: unhealthy diets. This collaboration aims to help curb cardiovascular disease in low-income urban communities by increasing access to healthy, affordable and nutritious foods through the Better Hearts Better Cities program.

LEVERAGING DIGITAL TECHNOLOGY

In addition to the work done by the Novartis Foundation, Novartis Social Business is working to develop digital solutions in lower-income countries to help improve their healthcare systems.

With Greenmash, we developed an IT system for Pakistan that registers patients, notifies patients of their next appointment, tracks medicine dispensing (addressing the risk of fraud by helping ensure medicines reach patients included in the prime minister's national health insurance program), and

9.3m

People reached through Novartis Foundation programs in 2018

71%

Hypertension control rate achieved for patients who were monitored for 12 months through the ComHIP program of the Novartis Foundation, up from 36% at baseline

provides essential information to monitor and manage medicine stocks. Reports, charts and maps are automatically generated, providing aggregated, real-time information to support decision-making by the Ministry of Health. We plan to deploy this solution in Pakistan when Novartis Access products become available in 2019.

In the Philippines, we are experimenting with a social business startup, Allied World Healthcare (AWH), to use technology and innovative collaborations to help solve common barriers to access. Working with other partners (Microsoft, PwC, the National University of Singapore and Singtel), and using expertise and funding from Novartis, AWH has developed a digital platform called Curis.

Patients registering on Curis during health camp sessions supported by health authorities and local community leaders have a digital patient record created based on their self-reported data. An algorithm flags potential health issues, and patients are then referred to a local healthcare practitioner who can address health concerns and add information to the patient record over time. The system also works offline, which is important in rural areas with weak internet connectivity.

The platform is now operational in one of the most populous districts of the Philippines, with 37 000 patients enrolled. We are also setting up a pilot to see whether community-based insurance could be offered to these communities, and we are developing a streamlined supply chain model with a leading distributor in the region. We have also started replicating this model in Cambodia.

In India, to address the shortage of qualified doctors in rural areas, the Arogya Parivar team set up a digital platform with information technology provider Tech Mahindra to connect patients to secondary care specialists. Doctors provide online consultations and diagnose patients based on an initial screening done by a trained nurse, who is with the patient. For the past year, we piloted this digital platform with Aquarelle, a supplier to apparel company Levi's, near Bangalore.

Health camps were held with workers from one plant, on topics including anemia, menstrual health, hygiene and diarrheal disease. Pilot results showed that 16% of factory workers were diagnosed as anemic and subsequently treated, and a subgroup analysis showed that absenteeism was reduced by 4% on average in little less than a year. We are currently discussing how to sustainably scale up the program with Levi's.

SUPPORTING HEALTHCARE SYSTEMS IN AFRICA

The Novartis Africa Health Alliance (NAHA) and the associated Health Education and Capability Fund (HECF) were formally launched in 2016 to contribute to long-term business growth in Africa through targeted health system strengthening initiatives. NAHA comprises commercial business leaders and global health experts from across the company. Since 2016, NAHA has provided almost USD 2 million for programs across Africa. Moving forward, it will expand to additional resource-limited settings, simultaneously contributing to health system strengthening needs while delivering long-term value to both the business and society.

TRAINING COMMUNITY HEALTHCARE WORKERS

Recognizing the importance of the role of community health workers (CHWs) in building stronger healthcare systems in developing countries, Novartis continues its support of Last Mile Health, which has partnered with the Liberian government to successfully establish a national CHW program called the National Community Health Assistant Program. In addition, Last Mile Health is developing the world's first digital education platform, called the Community Health Academy, for CHWs and the health system leaders who support them. To help launch this academy, Novartis is providing a USD 1 million donation over three years, in addition to providing input on the program's curriculum, content and strategic direction.

2m

Provided, since 2016, for health system strengthening programs across Africa through the Novartis African Health Alliance (USD)

Reviewing our approach to intellectual property

A robust intellectual property (IP) system is essential to our purpose of reimagining medicine to improve and extend people's lives. In our research-intensive field, the IP system provides a proven, practical means to attract the massive investments needed to conduct and sustainably finance research and development. However, we believe that the system needs to help ensure a fair balance between promoting creative and innovative activity and returning value to society. For that reason, among other factors, Novartis does not file or enforce patents in least developed countries or low-income countries.

In late 2018, we reviewed our approach to patent filing in low- and middle-income countries (LMICs) in an effort to better align it with the local socioeconomic circumstances that exist in many of these countries. As a result, effective 2019, we decided to stop filing patent applications in nine LMICs, where Novartis had previously filed. In addition, in the remaining LMICs, we will aim to restrict patent filings to those patent applications covering new molecules or new chemical entities.

In September, the World Intellectual Property Organization and the International Federation of Pharmaceutical Manufacturers & Associations launched the Patent Information Initiative for Medicines (Pat-INFORMED). Pat-INFORMED, of which we are a founding member, is a unique public online resource that provides basic patent information for medicines of participating companies. It aims to help procurement agencies around the world better understand patent status to help inform procurement decisions. As of December, Novartis has listed patent information for all of our small-molecule medicines, which goes significantly beyond Pat-INFORMED's near-term goal of capturing information for medicines in a more limited number of disease areas.

9

Number of low- and middle-income countries where Novartis decided to stop filing patent applications

Photo Marie Gratia Musanabera (left), a nurse entrepreneur who owns and runs a health clinic in rural Rwanda, speaks with one of her patients. Ms. Musanabera's clinic is part of an innovative network of more than 90 healthcare outposts in Rwanda affiliated with One Family Health, a nongovernmental organization.

Photo Amina Shafi, a 62-year-old charcoal seller in Addis Ababa, Ethiopia, has type 2 diabetes. Nearly 3 million Ethiopians have diabetes, but the overwhelming majority are undiagnosed.

STRATEGIC AREAS

Addressing global health challenges

We need to stop thinking about diseases as silos and start thinking more transversally. If we start to look transversally at the problems we've got and the solutions that may exist outside our field, then we can begin to address big healthcare issues

David Reddy
CEO, Medicines for Malaria Venture

2018 highlights

- Committed to invest USD 100 million over the next five years to advance R&D of new antimalarials
- Delivered nearly 900 million treatment courses of *Coartem*, including 370 million courses of the pediatric formulation, without profit
- Continued providing multidrug therapy for leprosy, free of charge, reaching a total of 7.2 million patients since 1999
- Collaborated with Microsoft and the Oswaldo Cruz Foundation, using AI in the early detection of leprosy
- Initiated collaboration with health authorities and local partners in Ghana to launch our commitment to sickle cell disease in Africa
- Launched a new partnership with the World Heart Foundation to develop a roadmap to address Chagas disease in Africa

Key challenges

- Challenges in maximizing the potential success of our R&D portfolio for antibiotics resulted in an out-licensing and equity agreement
- The global response to malaria elimination seems to have stalled, while the threat of parasite resistance to existing therapies remains strong
- There is reduced awareness in political and health communities about the need to continue efforts toward full leprosy elimination
- Extremely limited newborn screening services for sickle cell disease mean diagnosis often happens too late, resulting in high mortality for children under 5 years old

Why is it important? While the relative burden of noncommunicable diseases in developing countries is increasing significantly, there remains an unfinished agenda to control and eliminate tropical infectious and other neglected diseases. Neglected tropical diseases still affect over 1 billion people, and the recent World Malaria Report points to evidence that the global response to the fight against malaria has stalled.

Our approach

Novartis has a long heritage in tackling neglected tropical diseases, with two flagship programs targeting malaria and leprosy. To date, nearly 900 million treatment courses of our antimalarial, *Coartem*, including 370 million courses of a unique child-friendly formulation, have been delivered without profit, and approximately 60 million multidrug therapies for leprosy have been donated through the World Health Organization (WHO).

We also have a longstanding investment in research for various infectious and neglected diseases through the Novartis Institute for Tropical Diseases (NITD), which was founded in 2001 and is dedicated to finding new medicines for these diseases. In 2018 Novartis investment, including NITD, was more than USD 24 million, up very slightly on 2017. We continue to make strides against various infections, including malaria, African sleeping sickness, leishmaniasis, Chagas disease and cryptosporidiosis (diarrheal disease).

Drug discovery efforts at NITD have delivered an industry-leading pipeline of drug candidates to anticipate the emerging threat of artemisinin resistance and to support the malaria elimination agenda. Two drug candidates, KAE609 and KAF156, as well as an innovative formulation of lumefantrine are currently being evaluated in Phase II studies. These programs are conducted in partnership with the Medicines for Malaria Venture. In parallel, we are feeding the pipeline with new candidates that have a fast-acting blood-stage antimalarial profile. The current frontrunner compound and other related analogues are being investigated.

In April, we communicated our intention to invest more than USD 100 million over the next five years to advance research and development of new antimalarials, expand access to pediatric antimalarials, and invest in health infrastructure in Africa. This investment is meant to advance the Novartis malaria pipeline through 2023 and to complete comprehensive global clinical trial programs for KAF156 and KAE609. The investment also includes new uses of technology to identify areas where the malaria burden is greatest. This information could be used to support capability and capacity building to establish future clinical trial sites where medicines could be evaluated in the populations where they are most needed.

Novartis is a signatory to the London Declaration on Neglected Tropical Diseases, which aims to control, eliminate or eradicate 10 diseases by 2020. In line with our reaffirmed commitment, NITD and the Genomics Institute of the Novartis Research Foundation (GNF) have developed, in partnership with the Wellcome Trust, a promising portfolio of novel drug candidates for the treatment of three kinetoplastid diseases: human African trypanosomiasis (sleeping sickness), leishmaniasis and Chagas disease. GNF recently advanced LXE408 as a promising drug candidate for the treatment of visceral leishmaniasis, and Novartis is in advanced discussions with the Drugs for Neglected Diseases initiative to partner on the clinical development of this compound. NITD will also explore opportunities to collaborate with other relevant research groups within Novartis to target the host response in chronic stages of Chagas and leishmaniasis. Together with our leprosy elimination effort, this strategic focus on kinetoplastid parasitic diseases would address four out of 10 diseases in scope of the London Declaration.

~900m

Treatment courses of our antimalarial *Coartem*, including 370 million courses of our child-friendly formulation, have been delivered without profit since 2001

100m

Investment committed over the next five years to advance R&D of new antimalarials
(USD)

Diarrheal diseases are increasingly recognized as a leading cause of mortality, and cryptosporidium infection is a major pathogen responsible for diarrhea-associated death in young children in developing countries. Through an exploratory effort leveraging the results of our malaria research program, we recently identified the apicomplexan PI4K inhibitor KDU731 as a potential drug candidate for the treatment of cryptosporidiosis. The Bill & Melinda Gates Foundation supported the preclinical development of KDU731. Based on our learnings in the course of research and early development efforts in cryptosporidiosis, we may consider infectious diarrheal diseases more broadly in the mid to long term as part of our work to tackle global health issues.

In 2016, the WHO updated its guidelines for multidrug-resistant tuberculosis to include our medicine clofazimine as a recommended drug of choice. Further, in 2018, the WHO issued a rapid communication with revised guidance on tuberculosis, specifically on the longer regimen to treat multidrug- and rifampicin-resistant tuberculosis, prioritizing oral agents over injectables. Clofazimine is recommended as part of this revised regimen.

Accordingly, Novartis has been working to expand the clofazimine label to include this indication; clofazimine is currently only approved in combination with rifampicin and dapsone as a treatment for leprosy. The goal is to provide an affordable treatment in countries where tuberculosis remains prevalent. We recently upgraded our manufacturing capabilities in China to support this effort.

Novartis is continuing its partnership with the WHO to provide clofazimine, as part of a multidrug therapy, free of charge for leprosy patients in various lower-income countries. In addition, in 2017, Novartis began supplying clofazimine to partners (including the Bill & Melinda Gates Foundation, the Liverpool School of Tropical Medicine, and the Wellcome Trust) to investigate its use to treat cryptosporidiosis in people with HIV/AIDs in Malawi. This work continued throughout 2018.

Novartis is a co-founder and a member of the Swiss Alliance against Neglected Tropical Diseases (SANTD), a consortium of 12 Swiss nongovernmental organizations, educational institutes and pharmaceutical companies that have joined forces to combat neglected tropical diseases.

Helping address the needs of children

Children are not small adults when it comes to clinical pharmacology; they require treatments that are adapted in terms of regimen, dose and formulation. In recent years, progress has been made in the development of pediatric formulations, and advances have enabled greater dose flexibility, easier administration, and better tolerance by children. However, new pediatric formulations only address a small part of all therapeutic needs in children. Further, despite a reduction in child mortality by more than half since 1990, infectious diseases – including serious bacterial infections such as pneumonia and sepsis – continue to take a significant toll on children.

Responding to the call from UNICEF to combat childhood pneumonia, Sandoz developed pediatric amoxicillin, today recommended by the WHO as first-line treatment for childhood pneumonia. Over the last three years, Novartis Social Business has supplied more than 3 million pediatric amoxicillin treatment courses to UNICEF and Médecins Sans Frontières. Novartis is now also active in the fight against childhood pneumonia through the Every Breath Counts Coalition, a global network established in 2018. Coalition partners, representing more than 30 organizations, are working to help target and increase investments for pneumonia prevention, diagnosis and treatment to help end preventable child pneumonia deaths by 2030. Expanding pneumococcal vaccine coverage will be a top priority, along with increasing access to better diagnosis and treatment tools, including pulse oximetry, child-friendly amoxicillin and oxygen.

In September, we announced a partnership with the Global Antibiotic Research & Development Partnership to accelerate the development and availability of generic antibiotics to help reduce child

3m+

Pediatric amoxicillin treatment courses provided by Sandoz to UNICEF and Medecins Sans Frontieres over the last three years

deaths from drug-resistant infections. We are aiming to improve and adapt existing generic antibiotic formulations and dosing regimens for newborns and children. In particular, development will target heat-stable pediatric formulations against bacterial infections – a leading cause of death in children under age 5 in low- and middle-income countries.

Tackling leprosy elimination

Taking another step in our fight to eliminate leprosy, the Novartis Foundation was a founding member of the new Global Partnership for Zero Leprosy. It aims to accelerate progress toward a world without leprosy by coordinating research activities, strengthening existing national leprosy programs, and increasing advocacy and fundraising.

Since the introduction of multidrug therapy in 1981, the global burden of leprosy has been reduced by 99%. Novartis has donated multidrug therapy through the WHO since 1999, reaching more than 7 million patients worldwide. However, to finally eliminate leprosy, innovative solutions are required. The Novartis Foundation and Microsoft are partnering to develop a proof-of-concept digital health tool, enabled by artificial intelligence, and a Leprosy Intelligent Image Atlas – in collaboration with local investigators from the Oswaldo Cruz Foundation (Fiocruz) in Brazil – to aid in the early detection of leprosy. The launch of the first public version of the atlas is planned for 2019. The foundation has also been working with research partners to develop a leprosy diagnostic test. The hope is that, once this test is developed, leprosy will be diagnosed before significant nerve damage has occurred and the disease is transmitted to others.

Partnering on Chagas and sickle cell disease

In Latin America, we kicked off a new partnership with the World Heart Federation to develop a roadmap for addressing Chagas disease, the second most common cause of chronic heart failure in Latin America, affecting 8 million people in 21 countries. We also convened a two-day workshop at NITD in June that was attended by 15 expert parasitologists and physicians from around the world to discuss future drug discovery strategies for Chagas disease and leishmaniasis. Learnings from this event will help inform our R&D activities.

In Africa, we kicked off an effort to establish and strengthen partnerships around sickle cell disease (SCD), with the aim of understanding and helping address unmet needs. SCD is recognized by the World Health Assembly as a public health priority and is a neglected health problem in sub-Saharan Africa. Approximately 80% of individuals with SCD globally live in sub-Saharan Africa, and more than half of affected individuals die before age 5 due to preventable complications. The goal is to apply our learnings and expertise to create a holistic approach to help local partners tackle the disease over the next few years.

We took several steps in 2018 to facilitate this learning. A cross-functional team from Novartis visited Ghana for a week in April, meeting with multiple academic groups, the Ministry of Health, and representatives from hospitals, clinics and newborn screening sites, among others. In May, in parallel with the World Health Assembly, we convened a roundtable event in Geneva, Switzerland, that was attended by SCD stakeholders from six African countries. Additionally, in late October, Novartis Social Business hosted a workshop in Ghana to discuss opportunities to introduce hydroxyurea, a generic medicine that is used to treat SCD.

In 2019, we aim to launch our commitment to SCD in Africa, starting in Ghana, where we are already working with health authorities and local partners to develop a comprehensive and replicable model for improving access to medicines and care for patients with SCD. The collaboration is to include supporting the Ministry of Health and Ghana Health Service in establishing 10 SCD centers across Ghana, field-testing treatment guidelines and implementing a newborn screening program at the national level. At the same time, we submitted a registration dossier for hydroxyurea to treat SCD in Ghana and Kenya. In October, the Ghana Food and Drugs Authority approved hydroxyurea for the treatment of SCD. We anticipate the

7.2m

Patients worldwide reached since 1999 through our multidrug therapy donation for leprosy

medicine to be available there in 2019, marking the first time that hydroxyurea is provided to patients for this indication in Ghana.

Addressing drug resistance

Antibiotics are the cornerstone of modern medicine and have saved countless lives since their discovery. However, their effectiveness is being threatened by multidrug-resistant bacteria, and both their overuse and misuse contribute to the problem.

Antimicrobial resistance (AMR) is recognized by the WHO as one of the major threats to global public health. The Global Action Plan on AMR states that, without harmonized and immediate action on a global scale, the world is heading toward a post-antibiotic era in which common infections could once again become leading killers. It is estimated that AMR could lead to 10 million more deaths annually by 2050.

As a society, we must better safeguard the medicines we have today. We cannot just rely on new antibiotics coming to the rescue. A lot needs to be done, and we will undoubtedly achieve more working together than in isolation.

Sandoz, our generics division, is the world's largest provider of high-quality, affordable antibiotics. Today, 90 million patients in 130 countries receive treatment with antibiotics provided by Sandoz for a wide range of infections. We therefore recognize the need to find the right balance between improving access to existing antibiotics and ensuring that they are used in a responsible and sustainable way. Sandoz is actively involved in global and local partnerships to help ensure the responsible and appropriate use of existing antibiotics in line with the WHO guidelines.

For example, in 2015, Sandoz in Latin America created Better Care More Health (or Mejor Cuidado, Más Salud), an ongoing multimedia educational campaign on responsible antibiotic use, targeting physicians and pharmacists in eight Latin American countries. Sandoz is currently partnering to create a website and mobile app focused on AMR, with the aim of addressing prescriber needs for continuous medical education, and providing simple and efficient access to prescribing guidelines. In addition, Sandoz regularly organizes events to share medical information about appropriate antibiotic use across different regions, such as Central and Eastern Europe, the Middle East and Africa, including remote locations. It uses multichannel platforms to reach healthcare professionals.

In July 2018, Novartis announced the decision to exit antibacterial and antiviral research. While the science for the impacted programs was compelling, the company decided to prioritize its resources in other areas where it believes it is better positioned to develop innovative medicines that could have a positive impact for patients. However, the need for antibacterial and antiviral medicines is clear and, to maximize the chances that these programs will one day help patients, Novartis is actively engaged in out-licensing with companies focused on developing medicines in these areas.

In October, we announced a licensing and equity agreement with Boston Pharmaceuticals for the development of three novel anti-infective drug candidates in the Novartis portfolio that have the potential to treat antibiotic-resistant infections.

- LYS228 is a potential best-in-class monobactam that has entered clinical development and has demonstrated activity against carbapenem-resistant enterobacteriaceae (CRE) with resistance caused by serine beta-lactamases and/or metallo-beta-lactamases.
- IID572 is a novel beta-lactamase inhibitor that may be used in combination with LYS228 or other beta-lactam antibiotics to expand their use against difficult-to-treat infections caused by a broader spectrum of CRE.
- MAK181 is an oral, potentially first-in-class LpxC inhibitor for pseudomonas infections.

In December, as part of our strategy to partner and share data with external innovators committed to developing medicines that address global health challenges, we contributed data from

SANDOZ STATEMENT OF INTENT FOR ADDRESSING AMR: AREAS OF FOCUS

Prevention: initiatives to drive responsible manufacturing standards that help reduce the environmental impact of the production of antibiotics

Access: global and local collaborations with a range of partners to help improve access to anti-infectives

Stewardship: global and local initiatives to ensure prescription of the right drug at the right dose for the right duration

Innovation: non-traditional research and development to explore innovative solutions to prolong the life of existing antibiotics and improve patient adherence to therapy

our antibacterial research programs to the Pew Charitable Trusts' Shared Platform for Antibiotic Research and Knowledge (SPARK). Specifically, we transferred data sets from our LpxA, LpxD and LpxK programs, which are focused on attacking Gram-negative bacteria – a class of pathogens with tough defense mechanisms that comprise some of the most dangerous superbugs. SPARK is a cloud-based platform that brings together chemical and biological data from published studies and previously unpublished work focused on addressing antibiotic resistance. It is open and accessible to researchers around the world.

Novartis remains committed to innovation, with its pledge in April to advance the Novartis malaria pipeline through 2023; malaria is identified by the WHO as an area at risk from AMR (see page 30 of this report). Sandoz is also intensifying its focus in the area of non-traditional R&D to explore innovative solutions that could prolong the life of existing antibiotics and improve patient adherence to therapy to safeguard future antibiotic effectiveness.

Photo Dr. Yifter leads a weekly training session for medical students. As one of the few endocrinologists in Ethiopia, she knows it is imperative to train the next generation of doctors.

Photo Milena Remic, who survived chronic myeloid leukemia thanks to a transplant of blood-forming stem cells, speaks with attendees at an event in Prevalje, Slovenia, to recruit stem cell donors.

STRATEGIC AREAS

Being a responsible citizen

To prosper over time, every company must not only deliver financial performance, but also show how it makes a positive contribution to society. Companies must benefit all of their stakeholders, including shareholders, employees, customers, and the communities in which they operate

Larry Fink
CEO, BlackRock, in his letter to CEOs published in January 2018

2018 highlights

- Published and rolled out the Novartis Commitment to Patients and Caregivers
- Had an increase in enforcement cases, with more than 140 successful cases initiated or supported through a companywide strategy to combat falsified and counterfeit medicines
- Joined the UN Equal Pay International Coalition (EPIC)
- Became the first major pharmaceutical company to support the UN workplace standards protecting lesbian, gay, bisexual, transgender and intersex rights
- Ranked second in the Thomson Reuters Diversity & Inclusion Index, up from sixth in 2017
- Began the rollout of the Third-Party Risk Management program with the first country, Mexico
- Set new and ambitious environmental targets for 2030, including being carbon neutral by 2025, and plastic and water neutral by 2030

Key challenges

- The number of counterfeit incidents continues to increase, requiring stronger and more coordinated efforts across public and private sectors
- It will take several years to feel the impact of the culture change, which is currently being implemented
- The rollout of the Third-Party Risk Management program has taken longer than anticipated
- The biggest part (around 80%) of our environmental footprint is in the supply chain, making it a challenge to minimize impacts

Why is it important? Society's expectations of companies have never been greater. Today companies are increasingly expected to serve a social purpose – playing an active role in helping shape the world in which we live – and to respond to broad societal challenges. To achieve long-term growth, it is necessary to not only deliver financial performance but also make a positive contribution to society.

Our approach

As research shows, companies that take a leadership role on societal issues are more likely to do the right thing for all their stakeholders – employees, shareholders, customers, and the communities in which they operate – and to build enduring trust with these stakeholders. Building trust with society requires doing business responsibly wherever we operate. This includes ensuring the safety and well-being of everyone who uses our medicines, supporting and caring for our associates worldwide, respecting human rights, managing risk in our supply chain, and minimizing our environmental impact.

Helping ensure patient health and safety

Throughout the lifecycle of our medicines, we work to ensure the best balance of benefit and risk, and to maximize the safety and therapeutic benefits for patients. We have a variety of systems and processes in place for a continuous and systematic review of the data collected for all products in our portfolio, including those on the market and those in development. We focus our patient health and safety activities in three key areas: pharmacovigilance, safety profile and quality of drugs; combating counterfeit medicines; and health education and prevention.

BOOSTING PHARMACOVIGILANCE EFFORTS AND MAINTAINING PRODUCT QUALITY

One way to measure the success of our Group Quality activities is through health authority inspections of our manufacturing facilities. Of the total 202 health authority inspections completed in 2018, all but three were deemed good or acceptable (98.5%). One inspection was conducted by the European Medicines Agency supervisory authority (BfArM) for patient safety in Basel, Switzerland, and we are working with regulators to address open issues related to how we collect and manage reports of adverse events in patients taking our medicines. A second was conducted by the US Food and Drug Administration (FDA) for clinical trial monitoring oversight at Novartis in East Hanover, New Jersey, US, and corrective actions are being taken to address procedures for allocation of placebo versus experimental treatment among trial participants. Thirdly, a manufacturing site inspection was conducted by the Russian Ministry of Industry and Trade in Torre Annunziata, Italy, addressing registration requirement for the Russian market. Corrective and preventative actions are under preparation and on track.

We also work to boost pharmacovigilance capabilities in low- and middle-

98.5%

Of a total of 150 health authority inspections of our manufacturing facilities were deemed good or acceptable

Patient health and safety performance indicators

Pharmacovigilance, safety profile and quality of drugs performance indicators

	2018	2017	2016
Novartis Group Health authority regulatory reporting (ICSRs)[1] (%)[2]	**99.1**	NA	NA
Regulatory inspections without major findings (%)	**98.5**	99.1	98.1

[1] ICSRs: individual case safety reports
[2] Pharmacovigilance activities between the Innovative Medicines, Sandoz and Alcon Divisions have been integrated in 2017 under one single pharmacovigilance system, leading to one single health authority regulatory reporting metric as of January 1, 2018. Data reflects Jannuary to November 2018

income countries. For example, in Egypt, the team observed that there was a general lack of pharmacovigilance awareness among both patients and healthcare providers, linked to poor reporting of safety data. Novartis is working with both patient organizations and healthcare professionals in an effort to increase understanding of the importance of pharmacovigilance and to improve the timely reporting of safety data.

Pharmacovigilance training and awareness initiatives have also been introduced in Peru and Ecuador to help strengthen adverse event reporting and promote the overall importance of pharmacovigilance. The programs provide training to hospitals and local authorities, in areas including the reporting of adverse events.

Pharmacovigilance standards in East Africa are considered low by global standards, and there are limited educational opportunities that specifically focus on pharmacovigilance to improve health outcomes and help ensure patient safety. In 2015, Strathmore University in Nairobi, Kenya, partnered with Novartis to help develop its Institute for Health Care Management.

The institute specifically requested support to develop curricula in the areas of supply chain, health research, health financing and pharmacovigilance. Novartis leveraged its corporate volunteering program, using over 20 internal experts to address specific curriculum development needs on a voluntary basis. The feedback received from Strathmore University and course participants was highly positive, and in 2018, the university took ownership of the curriculum for integration into its own core programs.

COMBATING FALSIFIED AND COUNTERFEIT MEDICINES

Falsified medicines (including counterfeit medicines) pose a significant threat to public health, as they often contain no active ingredients, or harmful ingredients that can lead to therapeutic failure or severe harm and even death. They can also contribute to the rise of antimicrobial resistance. For example, the WHO estimates that up to 270 000 people die in sub-Saharan Africa each year from falsified and substandard antimalarials alone. According to the International Federation of Pharmaceutical Manufacturers & Associations, anti-infectives, cardiovascular, central nervous system and oncology are four of the five most falsified therapeutic areas impacting all regions, particularly low-income countries. Falsified medicines are found on both offline and online illicit markets, and sometimes also breach the legitimate supply chain.

This is an issue Novartis takes extremely seriously, and we are using a multipronged, companywide strategy to help tackle pharmaceutical crime. We made significant progress across the board in 2018.

Governance
The anti-counterfeiting program is sponsored by the Executive Committee of Novartis (ECN), led by Global Security, and actively supported by key functions. In October 2018, we announced the creation of a new risk function called Novartis Business Assurance & Advisory, with the Head of the function reporting directly to the CEO. It will host the anti-counterfeiting program going forward (see page 16 of this report for additional information).

Intelligence
We collect and analyze suspected medicines for forensic characterization, and we have built a risk management database that helps us identify trends, high-risk areas and products to better prioritize and allocate resources. We have also significantly expanded our in-house forensic capabilities to authenticate suspicious medicines by procuring two additional authentication spectrometric toolkits (i.e., mobile laboratories) covering the Americas and Asia-Pacific in addition to Europe, the Middle East and Africa. This allows for a faster, non-invasive and more effective authentication process of suspected falsified medicines to aid local health authorities and law enforcement initiatives as well as relevant requests for support. Additionally, we have launched a cross-functional pilot project to procure a substantial number of user-friendly and spectrometric sensors, based on the

140+

Successful enforcement cases in 23 countries targeting falsified or counterfeit medicines

latest technology available, to empower our regional clusters in key areas such as Africa and Southeast Asia with faster authentication means.

Prevention
We have enhanced our prevention strategy in three ways. We are strengthening our product security approach by extending, on a voluntary basis, the coverage of our in-house, technology-based overt/covert security features embedded on secondary packaging. We have broadened our global network of secondary packaging verifiers (PROVE) with more than 260 verifiers in over 80 countries who performed more than 2500 secondary packaging inspections of suspected falsified medicines in 2018. And we have engaged in regular market monitoring activities in high-risk countries, primarily in Africa and Asia. We have also designed and launched a global online market monitoring program using state-of-the-art technology to detect the sale of suspected falsified Novartis medicines through online pharmacies, social media and other commercial platforms.

Enforcement
We investigate all reported cases of falsified and counterfeit Novartis products – regardless of where they are made available – and we bring legal action, whenever possible, against those involved. The Pharmaceutical Security Institute reported a 7% increase in the number of counterfeit incidents in 2017 compared to 2016. This mirrors the very substantial increase in enforcement cases Novartis had in 2018, with more than 140 successful enforcement cases in 23 countries either initiated or supported, compared to 61 reported in 2017. We had notable success in disrupting illegal pharmaceutical manufacturing facilities in China and India, and disrupted import and wholesale activities in all other regions. We also actively contributed to large-scale operations led by international law enforcement agencies, such as the Interpol Pangea Operation XI, which took place in 116 countries and resulted in 859 arrests, 500 tons of falsified medicines seized, and 3671 rogue online pharmacies shut down.

Stakeholder engagement
Stakeholder engagement, beginning with awareness, is the cornerstone of our strategy. We started building a strong and large community of engaged Novartis associates united against pharmaceutical crime. We created and shared videos with all associates to present the program and the reality of pharmaceutical crime; launched a dedicated group on our internal social network for associates to stay up to date; and dedicated substantial resources to face-to-face training in countries. To further build capacity, we actively contributed to over 90 training and awareness initiatives, and reached out to more than 3800 Novartis associates and law enforcement and health authority officials in over 25 countries. Finally, in policy and advocacy, we worked in close collaboration with a large number of trade associations and governmental and nongovernmental organizations to build a strong public-private partnership globally and locally, and to increase the level of focus on combating pharmaceutical crime. We contributed to and endorsed the joint statements issued at the International Conference on Quality Medicines in Oxford, UK, and the Regional Conference on Combatting Pharmaceutical Crime in Phnom Penh, Cambodia.

Despite all stakeholders' best efforts to combat falsified and counterfeit medicines, which are paying off, the problem of pharmaceutical crime continues to grow and will require stronger and more effective joint and coordinated efforts from the public and private sectors to better protect patients' safety.

WORKING WITH PATIENTS AND CAREGIVERS

In February 2018, we published our Commitment to Patients and Caregivers, which outlines what patients and caregivers can expect from Novartis. This commitment provides a framework for our efforts to help ensure that thinking and acting with the patient at the center is firmly embedded in the way we work every day. It has four overarching pillars: respecting and understanding the patient community perspective, expanding access to our medicines, conducting responsible clinical trials, and recognizing the importance of transparency.

NOVARTIS COMMITMENT TO PATIENTS AND CAREGIVERS

Respecting and understanding the patient community perspective

Expanding access to our medicines

Conducting responsible clinical trials

Recognizing the importance of transparency and reporting

Partnerships with various stakeholders, including the patient community, regulators, academia and healthcare professionals, are critical to advancing our thinking and improving patient engagement. In April, we joined a collaboration among 34 public and private partners, called PARADIGM (Patients Active in Research and Dialogues for an Improved Generation of Medicines). PARADIGM aims to bring together key stakeholders to develop a framework for sustainable patient engagement, and the vision of a system that connects those who develop medicines and those who use them.

In September, PARADIGM and another patient-focused consortium, PREFER (Patient Preferences in Benefit-Risk Assessments during the Drug Life Cycle), signed a memorandum of understanding to enhance the cooperation and collaboration between the two projects. PREFER is co-led by Novartis and Uppsala University in Sweden, and looks at how and when it is best to include patient preferences in decision-making during the medical product lifecycle. By working together, we believe we can leverage the work of both projects to avoid duplication of efforts and to maximize results to better help patients.

Further details about prevention and education activities conducted by Novartis Social Business and the Novartis Foundation can be found on pages 21 and 26 of this report.

Caring for our people

Our company's culture is central to stimulating innovation, driving long-term value creation and maintaining our reputation. Our goal is to help ensure employees feel inspired, curious and unbossed. To better understand the state of our culture, in May we conducted an Organizational Culture Inventory®, a survey involving nearly 14000 employees. The results showed that employees overwhelmingly enjoy coming to work and are proud of the company, but they also revealed concerns about competitive behaviors and the desire for a more collaborative style of working.

As a result, during 2018, we took four major steps to transform our culture. First, to help ensure that employees understand our aspirations and are inspired to take action, we created a group on our internal social network that brings together more than 120000 members, with over 94000 active users and more than 7.3 million messages shared.

Second, we are helping employees apply the new culture in their daily activities. Our leaders know that we expect them to inspire and empower others, display curiosity and be self-aware. These expectations are reflected in a new 360-degree assessment that forms the foundation for leadership development in the company, and are now embedded in our immersive development programs. We also use an online tool called Team Perspectives to help managers improve their leadership skills by receiving upward feedback from their teams.

Third, we are working to ensure that the company's internal environment and processes encourage people to do their best work. For example, the process for reviewing employees' performance has been improved with simpler, informal check-ins, putting more emphasis on conversation and reducing written documentation. We have also introduced a companywide business performance factor, which is one element used to determine employees' annual bonuses. This replaced the 57 different performance factors based on individual groups or divisions.

Finally, we are taking steps to help employees sustain their energy and impact, both at work and in every other aspect of their lives. For many years, Novartis has offered programs to encourage a healthy lifestyle and flexibility at work. We are now taking an even more holistic, global approach to help associates realize their full potential, through the launch of a program called Energized for Life. Energized for Life aims to ignite everyone at Novartis to be their best self every day and everywhere. It consists of four core strategies to help everyone manage their

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Public and private partners, including Novartis, joined a collaboration called PARADIGM that aims to bring together key stakeholders to develop a framework for sustainable patient engagement

energy levels by making the right choices around mindset, nutrition, movement and recovery. In essence, Energized for Life encourages more flexible working practices and greater well-being through a range of programs, such as health and disease awareness.

In addition, we launched a program to support employees who are affected as a patient or caregiver by cancer, cardiovascular diseases or neurological diseases. It currently operates in Brazil, India, Italy, Switzerland and the US, and we plan to expand its reach in 2019.

DIVERSITY AND INCLUSION

Diversity and inclusion (D&I) has been a priority for Novartis over a number of years, with the ECN as well as members of the Human Resources Executive Leadership Team held accountable for D&I goals in their yearly objectives. We have maintained our focus on promoting D&I and were ranked second out of more than 7 000 companies in the 2018 Thomson Reuters D&I Index, up from sixth in 2017. Novartis remains committed to achieving gender balance in management within five years. Currently, four of the 19 senior positions reporting to the CEO are held by women. Two of them are ECN members, up from zero in 2017. Women make up 42% of management – similar to 2017. Of the top 350 leaders, 28% are women, also similar to 2017, and a slight increase in senior management is noted, up to 36% from 34% in 2017.

In September, Novartis joined the United Nations Equal Pay International Coalition (EPIC), with a pledge to continue its global practice of conducting regular gender pay equity analyses and remediating where appropriate. To help prevent pay differences, we have pledged to avoid using historic salary data when making job offers. We are also committed to pay transparency by telling employees how their pay compares to internal and external benchmarks.

To further increase the representation of women, in particular, in the management population, we are taking steps toward mitigating any biases that may exist in our staffing process. We began applying techniques to make our recruitment processes more objective and attractive to the right candidates, including training our recruiters specifically on unconscious bias management. One of our most important diversity goals is to increase the representation of women when hiring for senior positions, and there is evidence that a neutral tone in job postings, diverse interview panels and diverse candidate slates increase the chances of attracting and hiring more women.

Demonstrating our focus on inclusion, in 2018 Novartis became the first major pharmaceutical company to support the United Nations' workplace standards protecting the rights of lesbian, gay, bisexual, transgender and intersex people. Novartis recognizes that it is important to be sensitive to different identities that do not necessarily fit into binary male or female sex categories.

No. 2

Ranking in the 2018 Thomson Reuters D&I Index, up from sixth in 2017

42%

Of management is made up of women

Diversity and inclusion performance indicators

	2018	2017	2016
Management representation by gender (% female / % male) [1]			
Overall	**42 / 58**	41 / 59	40 / 60
Novartis Top Leaders [2]	**28 / 72**	27 / 73	25 / 75
Senior management	**36 / 64**	34 / 66	32 / 68
Middle management	**43 / 57**	42 / 58	42 / 58
Gender representation of Board of Directors (% female / % male)	**25 / 75**	23 / 77	25 / 75

[1] Management defined by Global Job Level Architecture and Novartis Top Leaders

[2] Novartis Top Leaders comprise the approximately 350 most senior managers at Novartis, including the Executive Committee of Novartis.

CORPORATE VOLUNTEERING

The Novartis corporate volunteering program operates a virtual platform that matches volunteers with volunteering opportunities. Co-sponsored by the Global Health & Corporate Responsibility and Human Resources teams, this online matching tool enables every Novartis associate to register a potential corporate responsibility project idea or sign up to become a corporate volunteer. In 2018, the program continued to grow, with nearly 700 associates registered to donate pro-bono skills and time, and around 180 new projects initiated. As in previous years, our largest global volunteering activity was our Community Partnership Day. In 2018, 23900 associates from six continents and 58 countries participated, dedicating 191200 hours to causes in their communities.

Further integrating human rights in our business

As a company that strives to be a responsible citizen, we are committed to conducting our business in a manner that respects the rights and dignity of all people. Therefore, we must avoid causing, contributing to or being linked to human rights violations, and promptly address any adverse human rights impacts we do identify in our own operations or in our supply chain.

The topic of human rights is high on the agenda at both the international and national levels, with governments worldwide expecting companies to undertake and disclose due diligence processes to help identify, assess and address human rights risks and impacts. A recent example of heightened international concern is the issue of modern slavery, including forced labor and human trafficking. Since 2017, we have been publishing on our website a modern slavery statement, setting out the steps we are taking to prevent modern slavery in our operations and supply chain, as required by the UK Modern Slavery Act (2015). Other countries, including Australia, France and Switzerland, have recently passed similar legislation or are in the process of outlining similar requirements. We aim to ensure that we can uncover any human rights abuses within the company and our supply chain, and proactively mitigate, remedy and report them as required.

In 2018, we started putting in place a team fully dedicated to human rights. This team is tasked with leading the development and implementation of our human rights strategy and due diligence program, including human rights impact assessments, awareness raising throughout the company, and development of the necessary internal capabilities to help meet our human rights commitments. The team will also help ensure that respect for human rights is embedded and integrated into all aspects of our business around the world.

To inform our human rights strategy and future due diligence program, we piloted three human rights assessments in Turkey, China and Malaysia (in addition to Egypt in November 2017). We have established that we have strong policies and solid processes to identify and manage potential human rights risks in our operations (e.g., comprehensive processes to try to ensure patient health and safety at all stages of the value chain; efficient workplace health and safety management systems; a living wage program; a functioning whistleblower system with a high level of awareness among associates; and a solid, responsible procurement organization). We have also identified these common risk areas that require follow-up action in 2019:

- Stakeholder engagement: More regular and broader consultation with external stakeholders is needed at the local level (from patient groups, local communities and health authorities to supply chain partners).
- Grievance mechanisms: We need to help ensure that formal grievance mechanisms and processes are in place for communities living close to our manufacturing operations.
- Third-party labor rights: In some of the markets we piloted, we need to address risks associated with our outsourced workforce.

Corrective action plans for the four pilot markets have been developed or are in the process of being developed.

190 000+

Hours dedicated by our associates globally to causes in their communities during Community Partnership Day

Maintaining a responsible supply chain

As a global healthcare company, Novartis engages with an extensive network of third parties worldwide. With such a global reach, it is essential to help ensure our goods and services are sourced ethically, based on a robust and documented process.

Responsible procurement (RP) is the way we seek to achieve that. It encourages companies that we do business with to meet the standards of ethics, business integrity and environmental practice we expect. Buying responsibly protects our patients, our people, our business and our reputation. It is built into the way we work and is fully integrated into our daily procurement activities. RP covers five areas of potential ethical risk: labor rights, HSE (health, safety and environment), animal welfare, anti-bribery and data privacy. Responsible procurement is aimed at taking responsibility to safeguard and improve ethical standards among our suppliers, and using our expertise to help them find lasting solutions to complex issues.

In 2018, 364 suppliers were identified as posing an elevated risk. Of these, 92 have active follow-up actions, including more information requested, audits or on-site assessments. In 2018, we audited 48 suppliers, representing 52% of those identified as requiring follow-up actions.

We have also taken steps to address suppliers who did not adhere to Novartis labor standards. For example, we found cases of suppliers using contractual clauses to help retain employees. However, these clauses could be interpreted as forced labor. We took steps to work with these suppliers to remove these clauses and set up new human resources processes to help retain employees within their organization.

The Novartis Supplier Code sets out our expectations for suppliers. It is aligned with the Novartis Code of Conduct and is based on the United Nations Global Compact, the United Nations Guiding Principles on Business and Human Rights, and other international standards and accepted good practices, such as those of the International Labor Organization. Novartis is also a member of the Pharmaceutical Supply Chain Initiative and supports its principles for responsible supply chain management for ethics, labor, health and safety, environment and related management systems. These principles are incorporated into the Novartis Supplier Code.

Our Global Policy of Procurement of Goods and Services from Third-Party Suppliers describes our expectations when committing company resources to suppliers. It defines a competitive environment as one in which our suppliers and/or potential suppliers can compete independently, fairly and transparently for the goods or services we wish to acquire on the basis of price, quality, service and other criteria. The policy is supplemented with a global procurement standard operating procedure that is applicable for all divisions, countries and sites, including the processes for competitive bidding and supplier selection.

Additionally, Novartis introduced a No Purchase Order (PO) No Pay policy effective October 1, 2018. This means that Novartis is strictly enforcing the policy that a PO is required for all goods and services ordered from all our external suppliers. By doing this, we are working to ensure that all our purchases of goods and services have the appropriate management approval and are in full compliance with all applicable laws and Novartis policies.

52%

Of suppliers identified as requiring follow-up actions have been audited

Supply chain performance indicators

	2018	2017	2016
Suppliers posing an elevated risk under responsible procurement [1]	**364**	459	441
Suppliers with active follow-up [1,2]	**92**	275	147
Suppliers audited [1]	**48**	49	76

[1] Includes new suppliers and new products, services or sites from existing suppliers. Figures include data on labor rights; health, safety and environment; and animal welfare.

[2] Follow-up includes more information requested, audits or on-site assessments.

Our approach to responsible procurement has evolved over time, and the need for an end-to-end model, applicable across all divisions and geographies, has been identified.

Continuing our work to implement our new Third-Party Risk Management (TPRM) program, we rolled it out in the first country, Mexico, in October 2018. We expect to build upon the launch in Mexico with a phased rollout worldwide in 2019, planned to begin in the Americas (including the US), followed by Asia-Pacific and Europe later in the year. TPRM creates an integrated approach using a single end-to-end process underpinned by one technology solution. TPRM provides a more consistent and rigorous approach to the management of third-party risks, a simplified process and stronger governance, as well as improved transparency. We believe that TPRM will enable the organization to more effectively manage third-party risks by focusing risk management efforts on areas where the risk is identified to be the highest.

As the program is implemented across geographies, we plan to incorporate all of our suppliers into this program over time. Using this operating model, we will be able to continuously scan for new risks, proactively take corrective measures where needed, and deliver continuous improvement in conjunction with our suppliers. It will also help us to more transparently measure and communicate the impact to the outside world.

Enhancing our environmental sustainability

Building trust with society also includes working to ensure that we minimize any negative impact we may have on the environment. We have made significant progress; while Novartis Group sales have more than doubled in the past 15 years, our consumption of energy and water has increased at a much slower pace, and greenhouse gas emissions have been reduced. However, we believe we need to do more, so in mid-2018, the ECN approved a set of more ambitious environmental targets, which aim for carbon neutrality by 2025, and plastic and water neutrality by 2030.

With regard to our carbon emissions and impact on the climate, our ambition is to make the company both energy and climate resilient. Concretely, this means first becoming carbon neutral in our own operations (Scope 1 and 2) by 2025, and then reducing our carbon footprint, including that of our supply chain (Scope 1, 2 and 3) by half versus 2016 levels by 2030.

The Responsible Procurement (RP) risk indicator tool

The RP risk indicator tool uses the category risk, country risk and contract value in combination to indicate a potential risk around the five areas of elevated ethical risk in the supply chain: labor rights, HSE general, HSE specific, animal welfare and anti-bribery.

THE RP RISK INDICATOR TOOL

	Labor rights	HSE general	HSE specific	Animal welfare	Anti-bribery
Policy or guidelines	Novartis Supplier Code	Novartis Supplier Code	HSE management system manual HSE guidance note 7.2 HSE guideline 8	Novartis Animal Welfare Policy	Novartis Anti-Bribery Policy and Third-Party Guideline
Applies to	All third-party suppliers	All third-party suppliers	Contract manufacturers, waste contractors, chemical producers, facilities or construction contractors working on our own sites	Third-party suppliers handling animals	Third-party suppliers acting on behalf of Novartis
Risk indication trigger	Category risk Country risk Contract value	Category risk Country risk Contract value	Category only (independent of country or contract value)	Category only (independent of country or contract value)	Category only (independent of country or contract value)
Assessment and due diligence	Depending on the risk type, policies and/or guidelines and related standards set forth the due diligence process for suppliers using a variety of tools, including desktop reviews, supplier questionnaires, assessment visits and audits.				
Collaboration/ engagement	Focuses on implementing improvement plans (developed after audits or other assessments) and other targeted initiatives to help suppliers improve their standards and ethical business practices				
Case review	If noncompliance is found through assessment and due diligence, the matter is escalated to a case review.				

In August, Novartis announced a virtual power purchase agreement in the US to reduce greenhouse gas emissions. In collaboration with a renewable energy company, Invenergy, Novartis aims to add 100 megawatts of wind power to the electrical grid. The electricity will be generated from Invenergy's Santa Rita East wind farm in Texas and is expected to be online in 2019. The 12-year agreement is expected to reduce our greenhouse gas emissions by more than 220 000 metric tons per year through the issuance of renewable energy attributes. This equates to removing more than 48 000 passenger vehicles from the road on an annual basis. Novartis will receive renewable energy credits for all of the electricity generated as a result of the project, which can be used to offset over 70% of the Novartis carbon footprint from purchased electricity in the US market.

Climate change puts our business operations – as well as our supply chain – at risk, and we need to be prepared for eventual changes that may jeopardize how we are able to discover, develop or deliver medicines in the future. In the US, we have been working with the Massachusetts Institute of Technology (MIT) on a project that uses computer simulations to analyze climate risks for over 60 of our most important locations worldwide. From this, we can consider appropriate actions and community collaboration on a case-by-case basis.

One example of local action is in Cambridge, Massachusetts, in the US – one of our key R&D locations. There, Novartis is a founding member of the Cambridge Compact for a Sustainable Future, a partnership between the city government, industry, academia and nonprofits focused on developing more sustainable business practices and a more resilient community in Cambridge. In 2018, we conducted a deep-dive assessment of a range of climate-related business risks in conjunction with MIT and the City of Cambridge. The study examined strategies that could be used to increase resilience to heat stress, flooding due to sea level rise, storm surge and increased precipitation locally. We helped design and facilitate a tabletop exercise at Harvard University that connected local stakeholders in a collaborative climate resilience effort, and we shared our newly modeled flooding data with the City of Cambridge for maximum community benefit.

We are aiming to minimize waste and increase material efficiency, with an ultimate goal of becoming plastic neutral. By 2025, we have committed to eliminate polyvinyl chloride (PVC) in

70%

Of the Novartis carbon footprint from purchased electricity in the US market is expected to be offset through renewable energy credits for all the electricity generated as a result of our project with Invenergy

Environmental performance indicators[1]

	2018	2017	2016
Energy use (million gigajoules), on site and purchased	**15.98**	16.24	16.39
Greenhouse gas (GHG) emissions, Scope 1, combustion and process (1 000 tCO_2e)	**401.28**	392.85	399.67
GHG emissions, Scope 1, vehicles (1 000 tCO_2e)	**145.51**	142.57	135.57
GHG emissions, Scope 2, purchased energy (1 000 tCO_2e)	**576.46**	714.97	785.13
GHG emissions, Scope 3, business travel (1 000 tCO_2e)	**425.70**	239.16	148.14
Total GHG emissions, Scope 1 and Scope 2 (1 000 tCO_2e)[2]	**1 123.24**	1 250.39	1 320.36
GHG offsets (1 000 tCO_2)	**73.40**	84.70	65.70
GHG emissions (Scope 1 and Scope 2) per sales (tCO_2e per million USD)	**21.81**	25.46	27.21
GHG emissions (Scope 1 and Scope 2) per associate (tCO_2e)	**9.25**	10.28	11.15
Halogenated volatile organic compounds (VOCs) (t)	**75.17**	75.58	43.59
Non-halogenated VOCs (t)	**588.42**	513.40	479.23
Non-hazardous waste recycled (%)	**77.00**	77.00	78.70
Hazardous waste recycled (%)	**62.30**	60.50	52.00
Non-hazardous waste not recycled (1 000 t)[3]	**19.29**	20.12	18.11
Hazardous waste not recycled (1 000 t)[3]	**45.87**	48.26	58.77
Water use (million m^3)[4]	**72.44**	75.77	79.21
Water discharge (million m^3)[5]	**15.42**	15.27	16.01

[1] The 2018 environmental sustainability data published in this report are actual data for the period from January through September, and best estimates for the period from October through December, which will be updated with actual data in the first quarter of 2019. Significant deviations will be reported on our website and restated in next year's report.

[2] Scope 1: combustion and process, and vehicles; Scope 2: purchased energy

[3] Reduction target is based on hazardous and non-hazardous waste intensity per tons produced.

[4] Sum of contact water and non-contact (cooling) water use

[5] Water discharged via treatment and water lost

packaging (i.e., secondary and tertiary packaging) and to reduce waste disposal by half versus 2016 levels. By 2030, we are aiming to be completely plastic neutral, with all new products meeting sustainable design principles.

We are working to achieve water sustainability, helping ensure sufficient and safe water by being a water steward wherever we operate. Our 2025 goal is to reduce water consumption in our operations by half versus 2016, with no water quality impacts from manufacturing effluents. By 2030, we aim to be water neutral in all areas of our operations, while actively enhancing water quality wherever we operate.

We started our journey in 2015 with the water and micropollutant targets for our own manufacturing sites and then expanded this target to our key suppliers. This approach is aligned with our commitment to combat the global threat of antimicrobial resistance (AMR Industry Roadmap), and our engagement in the Pharmaceutical Supply Chain Initiative. We are also working toward closing the data gap on the environmental impacts of our products by participating in the IMI-iPiE project and voluntary laboratory testing of generic products.

In drug development, we try to reduce our overall footprint by using good science in chemistry. The current focus is on continuous manufacturing, biocatalysis and surfactant technology, which support our approach to produce products under the premise of green chemistry.

We want to be a catalyst for positive change everywhere we work – driving environmental sustainability through our own operations, and empowering and inspiring partners across the world to demonstrate that businesses can be some of the most innovative, productive and responsible stewards of the environment. To truly have a positive environmental impact, we cannot limit our efforts to activities that take place within Novartis, since our supply chain makes up 80% of our overall environmental footprint. We therefore require our third-party suppliers to meet our standards for climate, water and waste management. These standards are embedded in our Novartis Supplier Code, and we will actively measure and hold our partners accountable for meeting these standards, and work with them to make improvements where needed.

We have already taken steps with our external supply chain to mitigate our exposure to environmental risk, completing a series of supplier audits and taking relevant actions. For example, in the Hyderabad area of India, we are severing ties with six suppliers that failed to comply with our Supplier Code, and we are working with nine suppliers to improve their performance in critical areas such as operational efficiency, waste management, and use of natural resources. These suppliers share our values for environmental stewardship and employee health and safety.

Beyond this, we are also beginning to look for ways to address environmental concerns with a direct impact on global health, especially in the developing world. For example, in Rwanda, in partnership with the UN Development Mechanism, Novartis will help provide cleaner burning cook stoves and water filters in 2019. These will be distributed in rural parts of the country, helping to reduce particulate matter in the air due to cook stoves, while also helping to reduce the incidence of diarrhea. Novartis is sponsoring 1 000 stoves impacting approximately 5 000 people.

NEW ENVIRONMENTAL TARGETS

Carbon neutral in own operations by 2025

Water neutral in all areas by 2030

Plastic neutral by 2030

Photo Milena Remic meets with colleagues in her office in Ljubljana, Slovenia. From her office, she advises and encourages patients on a daily basis.

About this report

For the sixth consecutive year, Novartis is publishing an annual Novartis in Society report (formerly our Corporate Responsibility Report). This report has been prepared in accordance with the GRI Standards: Core option. The report supplements the CR chapter in the 2018 Novartis Annual Review (pages 40-43) and the 2018 Novartis Annual Report. The previous report was published on January 24, 2018.

As a signatory to the United Nations Global Compact (UNGC), we are fulfilling our commitment through this report to produce a UNGC Communication on Progress – a public disclosure outlining our progress in implementing the 10 principles of the UNGC. We will also publish a more detailed UNGC Index on our website in the first quarter of 2019. On page 12, we discuss our contribution to the UN Sustainable Development Goals (SDGs). In addition, both the UNGC principles and the SDGs are clearly mapped versus the GRI indicators on page 51.

The report is divided into four chapters based on our CR material clusters and GH&CR priorities: holding ourselves to the highest ethical standards, being part of the solution on pricing and access, addressing global health challenges and being a responsible citizen. In each chapter, readers will find more focused and contextual information about the priority topics arising from our materiality assessment. Our materiality assessment is a key part of our CR strategy and provides much more than a list of priority CR topics to report against. It is part of a regular four-year cycle we have established to help us better understand the issues that matter most to our internal and external stakeholders, the impact these issues have on our current and future business, and the associated risks and opportunities for our company. Download the 2017 Corporate Responsibility Materiality Assessment.

As in previous years, the Governance, Nomination and Corporate Responsibilities Committee of the Board of Directors, which is the highest CR body in Novartis, has reviewed this report.

This report covers all regions and divisions from January 1, 2018, to December 31, 2018. All information reflects the continuing operations of the Novartis Group, including the various changes in the Group's portfolio of activities in prior years. Environmental data is based on nine-month actual data (January to September 2018) plus three-month estimates. This data will be restated with actual figures on our website during the first half of 2019. Where data has been restated from previous reports, it is noted in an appropriate footnote in this report. GRI Topic Boundaries show where we as a company have impact and create value.

This report aims to meet the needs and expectations of CR professional audiences by offering easy access to our performance on key topics raised by our CR materiality analysis. The GRI Content Index on page 51 provides links to content within this report, the 2018 Annual Review, the 2018 Annual Report and novartis.com.

PricewaterhouseCoopers AG has provided independent assurance on specific CR data and on our materiality assessment outlined in this report. For more detail, see the Independent Assurance Report on page 60.

Learn more about our CR activities.
See all our CR publications.
Receive the Novartis CR e-newsletter via email.

For feedback and suggestions, contact Jill Gregson, Head, Global Health & Corporate Responsibility Reporting: jill.gregson@novartis.com, or go to the feedback survey.

General Disclosures GRI 102

Management Approach GRI 103

Economic GRI 200

Environmental GRI 300

Social GRI 400

UN GLOBAL COMPACT
COMMUNICATION ON PROGRESS

This is our **Communication on Progress** in implementing the principles of the **United Nations Global Compact** and supporting broader UN goals.

We welcome feedback on its contents.

The UNGC has 10 guiding principles. The above icons reflect these relevant sections throughout the report.

SUSTAINABLE DEVELOPMENT GOALS

Ratings and recognition

access to medicine index

MEMBER OF Dow Jones Sustainability Indices In Collaboration with RobecoSAM

FTSE4Good

CDP DRIVING SUSTAINABLE ECONOMIES

Performance indicators 2018

Holding ourselves to the highest ethical standards

ETHICAL BUSINESS PRACTICES PERFORMANCE INDICATORS

	2018	2017	2016
Novartis associates trained and certified on the Code of Conduct[1]	**116 884**	114 913	110 774
Misconduct cases reported/allegations substantiated[2]	**951 / 618**	2 086 / 1 571	1807/1343
BPO allegations per category (%)[3]			
Fraud	**51**	50	46
Professional practices	**31**	29	36
Employee relations	**36**	32	27
Conflict of interest	**10**	6	6
Information protection	**4**	5	3
Quality assurance	**6**	7	6
Research and development	**1**	2	2
Other	**8**	8	8
Dismissals and resignations related to misconduct[4]	**311**	803	669

Animal testing indicators

Rodents	**360 417 (70.4%)**	415 333 (70.8%)	408 788 (80%)
Zebrafish	**149 474 (29.2%)**	168 201 (28.7%)	97 639 (19.1%)
Other species	**2 246 (0.4%)**	3 114 (0.5%)	4 489 (0.9%)

[1] Active Novartis associates with email addresses, trained via e-learning
[2] The number of misconduct cases reported may change, as matters may be reassessed in the course of the case lifecycle. The number of substantiated allegations may change due to the fact that investigation reports with assessments are received on an ongoing basis, which potentially leads to a difference in numbers at a later stage.
[3] One case can fall under several categories, so the total is greater than 100% and category figures total more than the stated number of cases. Investigation reports are received on an ongoing basis, which potentially leads to a reassessment of the allegation category and related figures.
[4] The number of dismissals and resignations related to misconduct may change due to the fact that investigation reports are received and then reviewed for remedial actions on an ongoing basis, which potentially leads to a difference in numbers at a later stage.

Being part of the solution on pricing and access; addressing global health challenges

ACCESS TO HEALTHCARE PERFORMANCE INDICATORS

	2018	2017
Total patients reached (millions)	**817**	886[1]
Patients reached through access programs (millions)	**24**	46
People reached through training, health education and service delivery (millions)[2]	**17**	15

	Patients reached (thousands)		
	2018	2017	2016
Local brands			
Novartis Pharmaceuticals	**213.3**	99.1	20.6
Novartis Oncology	**8.0**	6.5	NA

	Patients reached (thousands)			Value USD (millions)[3]		
	2018	2017	2016	**2018**	2017	2016
Patient assistance programs						
Novartis Patient Assistance Foundation Inc. (US)	**68.1**	55.5	51.2	**1 969.4**	1 466.4	1 115.0
Novartis Oncology Access	**71.1**	82.9	83.3	**1 310.9**	1 571.1	1 579.1

	Patients reached (thousands)			Value USD (millions)[3]		
	2018	2017	2016	**2018**	2017	2016
Donations						
Alcon medical missions[4]	**414.0**	391.9	484.0	**58.9**	61.2	73.0
Leprosy (WHO)	**176.2**	227.0	290.0	**5.2**	6.5	4.4
Fascioliasis/*Egaten*[5]	**294.0**	281.0	276.2	**2.9**	3.9	<1
CMLPath to Care™	**14.4**	NA	NA	**366.1**	NA	NA
World Child Cancer				**0.1**	NA	NA
Medicine donations (emergency relief)				**4.7**	10.9	1.8

	Patients reached (thousands)			Value USD (millions)			FTEs[6]			People reached (thousands)[7]		
	2018	2017	2016	**2018**	2017	2016	**2018**	2017	2016	**2018**	2017	2016
Social business models							**651**	555	535			
Novartis Access	**1 542.9**[8]	386.5	8.4									
Novartis Healthy Family	**720.8**	579.6	428.7							**7 804.6**	7 689.9	7 717.8
Novartis Malaria Initiative/*Coartem*	**20 778.0**[9]	33 441.8	48 939.2									

	Value USD (millions)[10]			FTEs[11]			People reached (thousands)[7]		
	2018	2017	2016	**2018**	2017	2016	**2018**	**2017**	2016
Novartis Foundation healthcare system strengthening	**16.5**	15.0	14.8	**17**	14	14	**9 354.8**[12]	7 080.6	8 908.6

[1] The 2017 patient number was restated to account for the Ophtha OTC brands that were carved out from Novartis Pharmaceuticals.
[2] Programs run by Novartis Social Business and Novartis Foundation. Programs at scale report the catchment of a population in the area where a program has been implemented.
[3] Wholesale acquisition cost (WAC) plus logistics costs for some programs
[4] Retail value for surgical products
[5] Manufacturing, testing and FTE costs
[6] Full-time equivalent positions and contractors
[7] Via training and service delivery and through health awareness activities
[8] The patient number was calculated based on treatments delivered and the following elements: daily treatment doses, treatment duration, treatment adherence and potential treatment overlap (as it is common for chronic patients to take several drugs). The treatment adherence and treatment overlap factors are based on assumptions from developed markets and will be revisited when we gain additional insights from Novartis Access rollout countries.
[9] Our patient reach has steadily declined over the past five years, due to the increasing availability of WHO prequalified generic ACTs, eligible for international donor-funded procurement. In addition, to harmonize the patient reach calculation methodology across Novartis, the malaria patient reach calculation was revised. We no longer consider a time lag between treatment shipment and patient reached. The calculation for malaria is now based on the treatments shipped in the respective calendar year.
[10] Operating costs
[11] Full-time equivalent positions
[12] Programs at scale report the catchment of a population in the area where a program has been implemented.

Being a responsible citizen

PEOPLE PERFORMANCE INDICATORS

	2018	2017	2016
Full-time equivalent positions / headcount [1]	**125 161 / 129 924**	121 597 / 126 457	118 393 / 122 985
Turnover: % voluntary / % overall	**7.1 / 11.5**	7.0 / 11.3	7.4 / 12.2
Voluntary turnover of high performers (%)	**5.5**	5.2	5.8
Internal hires / external hires (%)	**57 / 43**	55 / 45	47 / 53
External hires by gender (% female / % male)	**52 / 48**	53 / 47	53 / 47
Management representation by gender (% female / % male) [2]			
Overall	**42 / 58**	41 / 59	40 / 60
Novartis Top Leaders [3]	**28 / 72**	27 / 73	25 / 75
Senior management	**36 / 64**	34 / 66	32 / 68
Middle management	**43 / 57**	42 / 58	42 / 58
Gender representation of Board of Directors (% female / % male)	**25 / 75**	23 / 77	25 / 75
Associate nationalities / associate nationalities in management [2]	**147 / 115**	145 / 112	142 / 109
Annual training hours per employee [4]	**22.6**	24.5	26.9
Associates represented by a trade union/internal work council or covered by a collective bargaining agreement (%) [5]	**39**	39	41
Gender split of leavers (% female / % male)	**51 / 49**	49 / 51	50 / 50
Median tenure in years by gender (female / male)	**4.5 / 5.5**	NA	NA
Internal promotion by gender (% female / % male)	**48 / 52**	49 / 51	48 / 52
Revenue-producing roles by gender (% female / % male)	**47 / 53**	47 / 53	47 / 53
Novartis IT and engineering workforce by gender (% female / % male)	**36 / 64**	36 / 64	36 / 64
Lost-time injury and illness rate (per 200 000 hours worked) [6]	**0.16**	0.12	0.08
Total recordable case rate (per 200 000 hours worked) [6, 7]	**0.39**	0.37	0.31
Number of employees by employment contract (permanent and temporary), by gender [8]			
Women employed on a permanent contract	**60 303**	58 154	56 010
Women employed on a temporary contract	**3 437**	3 606	3 479
Men employed on a permanent contract	**64 171**	62 806	61 064
Men employed on a temporary contract	**1 967**	1 884	1 884
Number of employees by employment contract (permanent and temporary), by region [8]			
Employees on a permanent contract in Asia-Pacific region	**30 663**	29 546	27 944
Employees on a temporary contract in Asia-Pacific region	**1 665**	1 844	1 807
Employees on a permanent contract in Europe/Middle East/Africa region	**63 137**	60 870	58 554
Employees on a temporary contract in Europe/Middle East/Africa region	**3 370**	3 240	3 146
Employees on a permanent contract in Latin America region	**6 205**	5 954	5 872
Employees on a temporary contract in Latin America region	**224**	241	276
Employees on a permanent contract in North America region	**24 509**	24 596	24 704
Employees on a temporary contract in North America region	**148**	166	134
Number of employees by employment type (full time and part time), by gender [8]			
Women employed on a full-time contract	**55 918**	54 476	54 317
Women employed on a part-time contract	**7 822**	7 284	5 376
Men employed on a full-time contract	**65 047**	63 609	62 570
Men employed on a part-time contract	**1 091**	1 081	653

[1] Headcount reflects the total number of associates in our payroll systems. Full-time equivalent adjusts headcount for associates working less than 100%. All data as of December 31
[2] Management defined by Global Job Level Architecture and Novartis Top Leaders
[3] Novartis Top Leaders comprise the approximately 350 most senior managers at Novartis, including the Executive Committee of Novartis.
[4] There has been a significant move from classroom to virtual classroom learning, leading to a lower average time spent training.
[5] Non-management associates
[6] Data include Novartis associates and third-party personnel managed by Novartis associates.
[7] Includes all work-related injury and illness, whether leading to lost time or not
[8] Less than 0.5% of associates have unknown classification

PATIENT HEALTH AND SAFETY PERFORMANCE INDICATORS

Pharmacovigilance, safety profile and quality of drugs performance indicators

	2018	2017	2016
Novartis Group health authority regulatory reporting (ICSRs)[1] (%)[2]	**99.1**	NA	NA
Regulatory inspections without major findings (%)	**98.5**	99.1	98.1

SUPPLY CHAIN PERFORMANCE INDICATORS

	2018	2017	2016
Suppliers posing an elevated risk under responsible procurement[3]	**364**	459	441
Suppliers with active follow-up[3,4]	**92**	275	147
Suppliers audited[3]	**48**	49	76

ENVIRONMENTAL PERFORMANCE INDICATORS[5]

	2018	2017	2016
Energy use (million gigajoules), on site and purchased	**15.98**	16.24	16.39
Greenhouse gas (GHG) emissions, Scope 1, combustion and process (1 000 tCO_2e)	**401.28**	392.85	399.67
GHG emissions, Scope 1, vehicles (1 000 tCO_2e)	**145.51**	142.57	135.57
GHG emissions, Scope 2, purchased energy (1 000 tCO_2e)	**576.46**	714.97	785.13
GHG emissions, Scope 3, business travel (1 000 tCO_2e)	**425.70**	239.16	148.14
Total GHG emissions, Scope 1 and Scope 2 (1 000 tCO_2e)[6]	**1 123.24**	1 250.39	1 320.36
GHG offsets (1 000 tCO_2)	**73.4**	84.7	65.7
GHG emissions (Scope 1 and Scope 2) per sales (tCO_2e per million USD)	**21.81**	25.46	27.21
GHG emissions (Scope 1 and Scope 2) per associate (tCO_2e)	**9.25**	10.28	11.15
Halogenated volatile organic compounds (VOCs) (t)	**75.17**	75.58	43.59
Non-halogenated VOCs (t)	**588.42**	513.40	479.23
Non-hazardous waste recycled (%)	**77.0**	77.0	78.7
Hazardous waste recycled (%)	**62.3**	60.5	52.0
Non-hazardous waste not recycled (1 000 t)[7]	**19.29**	20.12	18.11
Hazardous waste not recycled (1 000 t)[7]	**45.87**	48.26	58.77
Water use (million m^3)[8]	**72.44**	75.77	79.21
Water discharge (million m^3)[9]	**15.42**	15.27	16.01

[1] ICSRs: individual case safety reports
[2] Pharmacovigilance activities between the Innovative Medicines, Sandoz and Alcon Divisions were integrated in 2017 under one single pharmacovigilance system, leading to one single health authority regulatory reporting metric as of January 1, 2018. Data reflects January to November 2018.
[3] Includes new suppliers and new products, services or sites from existing suppliers. Figures include data on labor rights; health, safety and environment; and animal welfare.
[4] Follow-up includes more information requested, audits or on-site assessments
[5] The 2018 environmental sustainability data published in this report are actual data for the period from January through September, and best estimates for the period from October through December, which will be updated with actual data in the first quarter of 2019. Significant deviations will be reported on our website and restated in next year's report.
[6] Scope 1: combustion and process, and vehicles; Scope 2: purchased energy
[7] Reduction target is based on hazardous and non-hazardous waste intensity per tons produced.
[8] Sum of contact water and non-contact (cooling) water use
[9] Water discharged via treatment and water lost

Novartis GRI Content Index

DISCLOSURE NUMBER	DISCLOSURE TITLE	UNGC PRINCIPLE	UN SDG	COMMENTS	REFERENCE
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102 – GENERAL DISCLOSURES					
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102-3	Location of headquarters				12
102-4	Location of operations				Annual Report 2018 Notes to the Novartis Group consolidated financial statements – F-80
102-5	Ownership and legal form				Annual Report 2018 Notes to the financial statements of Novartis AG – A-8
102-6	Markets served				Annual Review 2018 p.16
102-7	Scale of the organization				Annual Review 2018 p.4
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102-9	Supply chain	**3, 4, 5, 6, 8, 10**			42
102-10	Significant changes to the organization and its supply chain				Annual Report 2018 Notes to the Novartis Group consolidated financial statements – F-16
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102-17	Mechanisms for advice and concerns about ethics	**10**	16		Establishing Standards of Integrity
102-18	Governance structure				Annual Review 2018 p.48
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102-20	Executive-level responsibility for economic, environmental and social topics				9
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102-24	Nominating and selecting the highest governance body		5 16		Annual Report 2018 Item 6, p.178
102-25	Conflicts of interest		16		Annual Report 2018 Item 6, p.179
102-26	Role of highest governance body in setting purpose, values and strategy				Annual Report 2018 Item 6, p.181
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102-34	Nature and total number of critical concerns			Number and nature of concerns are not disclosed	
102-35	Remuneration policies				Annual Report 2018 Item 6, p.136
102-36	Process for determining remuneration				Annual Report 2018 Item 6, p.138
102-37	Stakeholders' involvement in remuneration		16		Annual Report 2018 Item 6, p.140
102-38	Annual total compensation ratio			Information is confidential and not disclosed	
102-39	Percentage increase in annual total compensation ratio			Information is confidential and not disclosed	
102-40	List of stakeholder groups				9 Stakeholder engagement
102-41	Collective bargaining agreements	3	8		49
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302-1	Energy consumption within the organization	7, 8, 9	7 8 12 13		
302-2	Energy consumption outside of the organization	8	7 8 12 13		
302-3	Energy intensity	8	7 8 12 13		
302-4	Reduction of energy consumption	7, 8, 9	7 8 12 13		
302-5	Reductions in energy requirements of products and services	8, 9	7 8 12 13		
303-1	Water withdrawal by source	7, 8	6 12		
303-2	Water sources significantly affected by withdrawal of water	7, 8, 9	6 12		
303-3	Water recycled and reused	7, 8, 19	6 12		
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305-6	Emissions of ozone-depleting substances (ODS)	7, 8, 9	3 12		
305-7	Nitrogen oxides (NOX), sulfur oxides (SOX), and other significant air emissions	7, 8, 9	3 12 14 15		
306-1	Water discharge by quality and destination	7, 8, 9	3 6 12 14		
306-2	Waste by type and disposal method	7, 8	3 6 12		
306-3	Significant spills	8, 9	6 12 14 15		
307-1	Noncompliance with environmental laws and regulations	8	3 12		
308-1	New suppliers that were screened using environmental criteria	8			Responsible Supply Chain Management
308-2	Negative environmental impacts in the supply chain and actions taken				Responsible Supply Chain Management
400 – SOCIAL					
401-1	New employee hires and employee turnover	6	5 8		49
403-2	Types of injury and rates of injury, occupational diseases, lost days and absenteeism, and number of work-related fatalities		3 8	Data not split by gender; data on non-occupational absenteeism, and on injury rate and occupational disease for contractors not available	49
403-3	Workers with high incidence or high risk of diseases related to their occupation		3 8		A Safe Workplace
403-4	Health and safety topics covered in formal agreements with trade unions		8		A Safe Workplace
404-1	Average hours of training per year, per employee	6	4 5 8		49
404-2	Programs for upgrading employee skills and transition assistance programs				Annual Review 2018 p.22
405-1	Diversity of governance bodies and employees	6	5 8		40, 49
409-1	Operations and suppliers at significant risk for incidents of forced or compulsory labor	4	8		41 Responsible Supply Chain Management
412-1	Operations that have been subject to human rights reviews or impact assessments	1	16		41
414-1	New suppliers that were screened using social criteria				42 Responsible Supply Chain Management
414-2	Negative social impacts in the supply chain and actions taken				Novartis Supplier Code Responsible Supply Chain Management

* The 2018 environmental sustainability data published in this report on p44 and 50 are actual data for the period from January through September, and best estimates for the period from October through December. This data as well as GRI 301-1 to 307-1 will be updated with actual data in the first quarter of 2019 on our website and restated in next year's report.

DISCLOSURE NUMBER	DISCLOSURE TITLE	UNGC PRINCIPLE	UN SDG	COMMENTS	REFERENCE
415-1	Political contributions				Public Policy & Advocacy
416-2	Incidents of noncompliance concerning the health and safety indicators impacts of products and services				36
417-1	Requirements for product and service information and labeling			We operate in a strictly regulated industry; this information is obligatory for us to have a license to operate.	37 Annual Report 2018 Item 4, p.53
418-1	Substantiated complaints concerning breaches of customer privacy and losses of customer data				47
419-1	Noncompliance with laws and regulations in the social and economic area				Annual Report 2018 Notes to the Novartis Group consolidated financial statements – F-49

To provide feedback on this Novartis in Society report, go to
→ the **feedback survey**

Appendix: corporate responsibility material topic boundaries

CR MATERIAL TOPIC BOUNDARIES

As a company, the impacts we have and the value we create extend well beyond our own operations. Using Novartis Global Health & Corporate Responsibility strategic priorities, we have analyzed topics identified as material by the 2017 CR materiality assessment and presented in this report in the context of our value chain. The resulting diagram displays the boundaries of our impacts (indicated in blue), and helps us better leverage opportunities and manage risks.

	Novartis simplified value chain		
Topic	**Supply chain**	**R&D, operations, distribution**	**Patients**
Holding ourselves to the highest ethical standards			
Ethical and compliant behavior	■	■	■
Transparency	■	■	■
Being part of the solution on pricing and access			
R&D for unmet needs	■	■	■
Affordability		■	■
Strengthening healthcare systems		■	■
Intellectual property	■	■	■
Addressing global health challenges			
Neglected and tropical diseases		■	■
Drug resistance	■	■	■
Being a responsible citizen			
Pharmacovigilance, safety profile and quality of drugs	■	■	■
Combating counterfeit medicines	■	■	■
Health education and prevention		■	■
Our people	■	■	■
Respect for human rights	■	■	■
Responsible supply chain	■	■	■
Environmental sustainability	■	■	■

Appendix: corporate responsibility materiality assessment issue cluster and topic definitions

1. Access to healthcare

1.1. Availability of medicines

Efforts to manage barriers that may prevent, restrict or delay medicine availability for patients in need. Examples may include the registration process requirements, inefficient distribution and supply chain management, etc.

1.2. Pricing

Responsible pricing for innovative and generic medicines that takes into consideration affordable access, positive cost-benefit ratio, and overall healthcare costs. Examples may include pricing models such as tiered pricing, managed entry agreements, outcomes-based pricing and non-exclusive voluntary licensing.

1.3. Healthcare system strengthening

Efforts to improve healthcare infrastructure and deliver healthcare-related services "beyond the pill." Examples may include capacity building, training and education, partnerships involving public and private actors to improve healthcare access in underserved areas, and contribution to reducing healthcare costs for payers, insurance companies and consumers.

1.4. Intellectual property

Responsible patent exclusivity management that balances IP protection with the provision of affordable drugs. Examples may include participation in IP-sharing arrangements and avoidance of compulsory licensing.

1.5. Patient assistance programs

Programs that support financially needy patients to either purchase their necessary medication at an affordable price or receive it for free.

2. Economic sustainability

2.1. Recruitment and retention of employees

Human resources management that aligns recruiting efforts with strategy and that provides talent management programs to engage and retain associates with relevant skill sets and ensure continuity through reduced associate turnover.

2.2. Fair contribution to society

Ensuring good relations and appropriate economic contribution in the areas in which the company operates. Examples may include payment of appropriate amount of tax and efforts to support the economy in countries of operation (e.g., local employment, local suppliers, active engagement in local initiatives).

2.3. Financial health and performance

Ensuring the company's continued viability, financial health and performance. Examples may include M&A, divesture activities, risk/crisis management and financial liquidity.

3. Environmental protection

3.1. Sustainable use of resources

Measures to ensure efficient consumption of energy, water and other resources. This includes efforts to responsibly source, recycle and/or reuse natural resources; manage the company's impact on plant and animal life; and preserve biodiversity.

3.2. Pollution, waste and effluents

Reduction and management of emissions, pollution, waste (including use of hazardous chemicals and ozone-depleting substances) and effluents. This includes activities to mitigate climate change and its impacts on human health.

3.3. Pharmaceuticals in the environment

Efforts to minimize the environmental impact of our activities and products over their lifecycle and to ensure proper and legal disposal of waste containing active pharmaceutical ingredients.

4. Ethical business practices

4.1. Ethical and compliant behavior

Processes and systems to ensure Novartis operates in line with high ethical standards, especially in regard to our interactions with healthcare professionals. Examples may include adherence to laws and regulations, anti-bribery, anti-corruption and anti-trust; responsible advocacy, lobbying and political contributions; and responsible incentive structures and compensation.

4.2. Animal testing

Measures to keep animal testing at a minimum and ensure tests are conducted according to the highest animal welfare standards.

4.3. Respect for human rights

Positions, policies and management systems to respect human rights across the business and direct supply chain. Examples may include implementation of responsible clinical trials in developed and developing countries, protection of personal data, and the right to health/healthcare.

4.4. Responsible supply chain management

Processes and systems to ensure a responsible supply chain and that our direct suppliers uphold appropriate standards on financial, social and environmental issues. Examples may include outsourcing, third-party manufacturing, the use of clinical research organizations, supplier audits and transparent reporting practices.

4.5. Responsible use of new technologies

Ensuring appropriate handling of and response to controversial ethical questions related to technological advancements. Examples may include cloning, human

genetic engineering (e.g., genome editing through CRISPR), nanotechnology, wearables and life extension.

5. Good governance

5.1. Corporate governance

Ensuring the company management structure balances the interests of its relevant stakeholders, and the company is transparent and discloses critical information to stakeholders. Examples may include rules and regulations to ensure board independence, shareholder rights and engagement, and levels of executive compensation and golden parachutes.

5.2. Transparency

Ensuring appropriate scope and quality of information disclosure and reporting, and engaging in dialogue with our stakeholders. Examples may include disclosing information that is critical to stakeholders such as the risk/safety profiles of products, misconduct cases, support of patient groups and political parties, and trial data.

5.3. Data privacy and security

Systems to ensure that the personally identifiable information of patients, employees, consumers and others is responsibly and securely collected, transferred and stored.

6. Innovation

6.1. R&D for unmet medical needs

Maintaining high investments in creating innovative medicines that address unmet medical needs, with a focus on maximizing patients' outcomes before considering market potential. This includes the research of new compounds but also the modification of existing medicines (i.e., to improve access or efficacy for poor and specifically vulnerable patient groups).

6.2. R&D for neglected diseases

R&D for diseases that disproportionately affect people in low-income settings, for which little or no treatment options are available and where market failure limits research activities. This may include infectious and tropical diseases.

6.3. Business model innovation

Efforts to respond to emerging health needs and trends by changing the existing business model and/or developing new business models. Examples may include responding to the needs of low-income patients and to the growing healthcare burden of noncommunicable diseases (NCDs).

6.4. Innovative technologies

Making the most of advances in IT and digital connectivity to advance R&D for products and outcomes and to revolutionize the delivery of healthcare services. Examples may include using big data analysis or developing personalized healthcare solutions (e.g., products with companion diagnostic tests), and improving health solutions based on data collected by wearables.

6.5. Drug resistance

Contributing to the global response to drug resistance that is caused, for example, by inappropriate use and environmental pollution through antimicrobials.

7. Our people

7.1. Diversity and inclusion

Ensuring equal opportunities and fostering a diverse and inclusive workplace where each associate can contribute and be recognized. This applies in terms of age, ethnicity, gender, nationality, language, sexual orientation, physical ability, and religious and personal beliefs.

7.2. Health and safety

Ensuring the health and safety of associates. This includes efforts to reduce fatalities, injuries and sick leave, and to promote well-being through health programs.

7.3. Fair working conditions

Ensuring fair employment practices, including upholding labor rights to freedom of association and collective bargaining, labor relations and union practices, and fair compensation and benefits. This may also include work-life balance considerations.

8. Patient health and safety

8.1. Health education and prevention

Efforts to promote health literacy, disease prevention awareness, and the effective use of medicines. Examples may include treatment adherence, contributing to solutions to the rising burden of NCDs and chronic illnesses, and substance abuse prevention.

8.2. Counterfeit medicines

Using the company's influence to fight counterfeit drugs around the world.

8.3. Pharmacovigilance, safety profile and quality of drugs

Ensuring healthcare products (patented pharmaceuticals and generics) are manufactured at the highest quality level and that the efficacy and safety features of a medicine outweigh its risks (e.g., side effects), as well as collecting and recording adverse event reports. This includes transparent and timely communication in the case of product safety or quality issues (e.g., prompt product recalls).

Appendix: external initiatives and membership of associations

GRI 102-12: External initiatives

- Joined Access Accelerated, a global initiative to advance access to treatment and care for chronic diseases in lower-income countries in collaboration with the World Bank Group and the Union for International Cancer Control
- Signatory to the London Declaration on Neglected Tropical Diseases
- Novartis is a member of the Swiss Alliance against Neglected Tropical Diseases
- Signatory to the Davos Declaration on Combating Antimicrobial Resistance (AMR)
- Committed to the Industry Roadmap for Progress on Combating AMR
- Joined the AMR Industry Alliance
- Novartis joined the United Nations Equal Pay International Coalition (EPIC)
- Novartis signed the Women's Empowerment Principles launched by the UNGC and the UN Development Fund for Women (UNIFEM).
- As a signatory to the UNGC, Novartis supports the Universal Declaration of Human Rights, the ILO's Declaration on Fundamental Principles and Rights at Work, the Rio Declaration on Environment and Development, the UN Convention Against Corruption, the Organization for Economic Cooperation and Development (OECD) Guidelines for Multinational Enterprises, the OECD Convention on Combating Bribery of Foreign Public Officials, and the UN Guiding Principles on Business and Human Rights.
- Support for the United Nations' workplace standards protecting the rights of lesbian, gay, bisexual, transgender and intersex people
- Signatory to the International Chamber of Commerce's Business Charter for Sustainable Development
- Signatory to the ILO Tripartite Declaration of Principles Concerning Multinational Enterprises and Social Policy
- Signatory to the CEO Letter on the UN Convention Against Corruption
- Support for the Pharmaceutical Industry Principles for Responsible Supply Chain Management set by the Pharmaceutical Supply Chain Initiative (PSCI)
- Voluntarily agreed to reduce greenhouse gas (GHG) emissions in line with the Paris Agreement and subsequent international target commitments, such as those of the European Union (GHG emissions are reported according to the GHG Protocol)
- Signatory to the UNGC/UNEP/World Business Council for Sustainable Development (WBCSD) initiative Caring for Climate: The Business Leadership Platform, also fulfilling the Business Leadership Criteria on Carbon Pricing
- Classify and dispose of waste according to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal
- Member of the Carbon Disclosure Project, Water Disclosure Project and Supply Chain Disclosure Project
- Signatory to WBCSD's Manifesto for Energy Efficiency in Buildings
- Signatory to the Guiding Principles on Access to Healthcare (GPAH), which frame the pharmaceutical industry's approach to expanding access to quality healthcare globally
- Strategic partner of the World Economic Forum

GRI 102-13: Membership of associations

Novartis Group companies are members of various chambers of commerce, sustainability industry associations and pharmaceutical industry associations.

We work closely with trade associations, which create opportunities to raise industry standards and exchange best practice.
Novartis is a member of:

- the European Federation of Pharmaceutical Industries and Associations (EFPIA)
- the International Federation of Pharmaceutical Manufacturers & Associations (IFPMA)
- Interpharma, economiesuisse and scienceindutries in Switzerland
- Pharmaceutical Research and Manufacturers of America (PhRMA), Association for Accessible Medicines (AAM) and the Biotechnology Innovation Organization (BIO) in the US
- vfa – Die forschenden Pharma-Unternehmen in Germany
- Association of British Pharmaceutical Industry (ABPI) in the UK
- Farmindustria in Italy
- Innovative Medicines Canada in Canada
- Farmaindustria in Spain
- Interfarma in Brazil
- National associations in most markets where Novartis has a legal subsidiary

Appendix: supplier spend 2018

Supplier spend

	Spend			Supplier[3]	
Country	Total %	Direct spend %[1]	Indirect spend %[2]	Total	%
United States	29.32	22.13	31.93	8 140	11.02
Switzerland	26.19	22.79	27.42	7 437	10.07
Germany	7.55	9.48	6.85	8 089	10.95
Austria	4.77	8.80	3.31	3 663	4.96
Japan	2.20	1.71	2.38	3 956	5.36
France	2.07	1.36	2.33	2 637	3.57
China	2.03	1.09	2.37	3 550	4.81
Canada	1.94	4.62	0.97	1 194	1.62
Spain	1.89	2.43	1.70	1 875	2.54
Belgium	1.66	3.16	1.12	1 422	1.93
Ireland	1.51	2.05	1.31	1 183	1.60
Italy	1.42	1.16	1.51	1 678	2.27
Singapore	1.25	1.32	1.23	1 349	1.83
United Kingdom	1.24	0.72	1.43	1 398	1.89
India	1.17	1.68	0.98	3 013	4.08
Rest of the world	13.79	15.51	13.17	31 169	42.20
Grand total	**100**	**100**	**100**	**73 856**[4]	**100**[4]

[1] Purchase of goods and services directly incorporated into a product being manufactured. Example: raw material, subcontracted manufacturing services, packaging

[2] All suppliers necessary to run an organization, such as utilities, IT hardware/software, furniture, capital expenditure, marketing supplies, etc.

[3] Suppliers with whom we have a direct contractual relationship pertaining to the delivery of goods and services

[4] The sum of individual country totals is larger than the grand total because one supplier can serve multiple countries. Suppliers are counted for each country they serve, but they are counted only once for the grand total.

Appendix: measuring and valuing our impact

White paper: operationalizing impact valuation
The global economic impact of Novartis: case study
The social impact of Novartis medicines: two case studies from South Africa and Kenya
The environmental impact of Novartis along global supply chains: case study
Valuing the impact of wages on human capital
Monetizing impact dimensions of material issue areas

Independent Assurance Report on the Novartis 2018 corporate responsibility reporting

To the Board of Directors of Novartis AG, Basel

We have been engaged to perform assurance procedures to provide limited assurance on the following aspects of the 2018 corporate responsibility (CR) reporting of Novartis AG and its consolidated subsidiaries (Novartis Group) included in the 2018 Novartis in Society report.

SCOPE AND SUBJECT MATTER

Our limited assurance engagement focused on the following data and information disclosed in the consolidated Novartis in Society report of the Novartis Group for the year ended December 31, 2018:

- The "ethical business practices performance indicators" on page 47, the "access to healthcare performance indicators" on page 48, the "people performance indicators" on page 49, the "supply chain performance indicators" on page 50, and the "environmental performance indicators" on page 50 (CR indicators)
- The materiality determination and stakeholder engagement process of Novartis at the Group level according to the requirements of the GRI Sustainability Reporting Standards (GRI Standards), published by the Global Reporting Initiative (GRI) and disclosed on pages 9 and 46
- Reporting processes and related controls in relation to data aggregation of CR indicators

The "pharmacovigilance, safety profile and quality of drugs performance indicators," the "animal testing indicators," the "gender split of leavers," the "median tenure in years by gender," the "internal promotion by gender," the "revenue-producing roles by gender," the "Novartis IT and engineering workforce by gender," the "number of employees by employment contract (permanent and temporary), by gender," the "number of employees by employment contract (permanent and temporary), by region," and the "number of employees by employment type (full time and part time), by gender" are not subject to this Assurance Report. Consequently, we do not express any conclusion on this data.

CRITERIA

The management reporting processes with respect to the CR reporting and CR indicators were assessed against GRI Standards guidelines and Novartis Group internal policies and procedures, as set forth in the following:

- Guideline on Corporate Responsibility Management at Novartis and the Code of Conduct
- Procedures by which the data for the CR indicators reporting is gathered, collected and aggregated internally

INHERENT LIMITATIONS

The accuracy and completeness of CR indicators are subject to inherent limitations given their nature and methods for determining, calculating and estimating such data. Our Assurance Report should therefore be read in connection with Novartis Group guidelines, definitions and procedures on CR reporting.

NOVARTIS RESPONSIBILITIES

The Board of Directors of Novartis AG is responsible for both the subject matter and the criteria as well as for the selection, preparation and presentation of the information in accordance with the criteria. This responsibility includes the design, implementation and maintenance of the internal control system related to this reporting process that is free from material misstatement, whether due to fraud or error.

OUR RESPONSIBILITIES

Our responsibility is to form an independent opinion, based on our limited assurance procedures, on whether anything has come to our attention to indicate that the CR indicators are not stated, in all material respects, in accordance with the reporting criteria.

We planned and performed our procedures in accordance with the International Standard on Assurance Engagements (ISAE) 3000 (revised) "Assurance engagements other than audits or reviews of historical financial information." This standard requires that we plan and perform the assurance engagement to obtain limited assurance on the identified CR indicators prepared, in all material aspects, in accordance with the Novartis Group internal policies and procedures.

A limited assurance engagement under ISAE 3000 (revised) is substantially less in scope than a reasonable assurance engagement in relation to both the risk assessment procedures, including an understanding of internal control, and the procedures performed in response to the assessed risks. Consequently, the nature, timing and extent of procedures for gathering sufficient appropriate evidence are deliberately limited relative to a reasonable assurance engagement and, therefore, less assurance is obtained with a limited assurance engagement than for a reasonable assurance engagement.

OUR INDEPENDENCE AND QUALITY CONTROL

We have complied with the independence and other ethical requirements of the Code of Ethics for Professional Accountants issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behavior.

Our firm applies International Standard on Quality Control 1 and accordingly maintains a comprehensive system of quality control, including documented policies and procedures regarding compliance with ethical requirements, professional standards, and applicable legal and regulatory requirements.

SUMMARY OF WORK PERFORMED

- Evaluation of the application of Group guidelines
  Reviewing application of the Novartis Group internal CR reporting guidelines
- Management inquiry
  Interviewing personnel responsible for internal reporting and data collection
- Assessment of key figures
  Performing tests on a sample basis of evidence supporting selected CR data concerning completeness, accuracy, adequacy and consistency
- Inspection of documentation and analysis of relevant policies and principles
  Inspecting relevant documentation on a sample basis, including Group CR policies, management reporting structures and documentation
- Assessment of the processes and data consolidation
  Reviewing the management reporting processes for CR reporting, and assessing the consolidation process of data at Group level and their related controls
- Evaluation of the materiality determination and stakeholder engagement process
  Inspecting the principles of the Novartis materiality assessment process providing the basis for adherence to the GRI reporting requirements, addressing the soundness of the methodology, the identification process, the determination of the impacted stakeholders, as well as the prioritization based on the assessed impact of Novartis

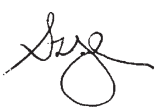
We have not carried out any work on data other than what is outlined in the scope and subject matter section as defined above. We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our assurance conclusions.

LIMITED ASSURANCE CONCLUSION

Based on our work described in this report, nothing has come to our attention causing us to believe in all material respects that:

- The CR indicators outlined in the scope and subject matter section and disclosed in the 2018 CR reporting of Novartis Group are not stated in accordance with Novartis Group internal policies and procedures
- The materiality determination and stakeholder engagement process of Novartis does not adhere to the principles and guiding factors defined with the GRI Standards
- The reporting processes and related controls in relation to data aggregation of CR indicators are not functioning as designed

PricewaterhouseCoopers AG



STEPHEN JOHNSON **JENNIFER KODAT**

Basel, January 29, 2019

Back cover photo Marie Gratia Musanabera, a nurse entrepreneur who owns and runs a health clinic in rural Rwanda, weighs a baby.


NOVARTIS