

A close-up photograph of a woman with short dark hair and blue eyes, looking upwards and to the left. She is applying red lipstick with a black tube. She is wearing a blue top, a teardrop earring, and a beaded bracelet. The background is a plain, light-colored wall.

Annual Report 2018

PATIENTS

In cancer, modern care helps where no effective treatments were available previously. Innovative therapies allow this woman on the cover picture to carry on with her life. See back cover for more.

INNOVATION

Advanced analytics enable us to create a wealth of new data insights and opportunities across the entire product lifecycle and R&D value chain to ultimately improve outcomes for patients.

PARTNERS

Roche is expanding its collaborations, combining its own strengths with the unique tools of its partners to elevate personalised healthcare to a new level for many more patients.



Keith Terry, Genentech, USA

“This was an emotional hire for me.”

I am the Medical Doctor Talent Scout for Genentech in South San Francisco and work closely with our Product Development Neuroscience team. Ironically, I had a big win with the hiring of a senior medical director for Ocrevus, the medication that I currently use to treat my multiple sclerosis (MS). This was an emotional hire for me.

I was diagnosed with multiple sclerosis 16 years ago at the age of 37. I had been experiencing extreme fatigue and loss of some motor function in my hands for some time. Then it was numbness in my torso and arms. I believe I had MS for about a year before actually being diagnosed. Prior to that, I had just ignored the fatigue and thought this must be happening because of getting older or not getting enough vitamins. I used to power through when I felt fatigued, but then a major event occurred and I could not ignore it any more.

This happened as I was leading a hiring initiative for a bank. I was writing on a white board and kept dropping the pen. I felt really weak in my left arm and hand. I thought I was having a heart attack. I ended up in the emergency room but it was not a heart condition. I was sent home but kept feeling worse and worse. I visited four different emergency medical centres before an MRI showed lesions on my spinal cord and in my brain. It was multiple sclerosis.

The diagnosis has made me focus on the important things—developing and enhancing relationships

with family and friends—and not dwell on the negative. It has taught me to stay in the moment. There have been some down times too, when I experienced a relapse. I felt so fatigued that it was an effort just to breathe. It is difficult to imagine this level of fatigue until you have experienced it. This illness has really increased my capacity for empathy for those that are ill.

But overall there have been many positives. I have met so many amazing people through my MS experience. I have been an active member of the MS society and led a support group for individuals with MS for over five years. I also participated in the local MS walk in my community. I try to get some exercise every day in some capacity; this seems to really help. Also, having a good diet has been important. There are challenges, though. The motor function in my hands has definitely decreased. Also, my short-term memory has been affected.

For others with MS, I would say—get involved. There are great things going on in the MS community. Also, do not ignore your symptoms, including depression. It is a common symptom and often ignored. I had depression related to MS, too. I used to have good days and bad days with my illness. However, since I started taking Ocrevus about a year and a half ago, now almost all my days are good with a high level of energy. And I am thankful for that!

Innovation:

It's in our DNA

We have always worked across disciplines and geographies to drive scientific discovery and redefine what is possible to improve patients' lives.

We are working on understanding how diseases differ down to the molecular level so we can develop new tests and medicines that prevent, diagnose and treat diseases, and bring them to the patients who need them. With our combined strengths in diagnostics and pharmaceuticals, our personalised healthcare strategy aims to fit the right treatment to the right patient.

As the world's largest biotech company, we develop breakthrough medicines, improving the standard of care across oncology, immunology, infectious diseases, ophthalmology and neuroscience.

We are also the world leader in the *in vitro* diagnostics business. This track record allows us to build lasting and meaningful partnerships across the world with research academia and public healthcare institutions.

The founding families continue to hold the majority voting stake in the company. This stability allows for a tradition of sustainable thinking, so we can learn from setbacks and focus on lasting value for patients and society. We remain dedicated to the highest standards of quality, safety and integrity. Our legacy is based on respect for the individual as well as the communities and the world we live in.

94,442

employees* worldwide

North America

25,135 employees

- Genentech, South San Francisco, US (●●●)
- Roche Diagnostics, Indianapolis, US (●●●)

Europe

41,127 employees

- Basel, Kaiseraugst and Rotkreuz, Switzerland (●●●)
- Mannheim and Penzberg, Germany (●●●)

Asia

21,849 employees

- Chugai, Tokyo, Japan (●●●)
- Shanghai and Suzhou, China (●●●)

Latin America

4,431 employees

Africa

1,220 employees

Australia/New Zealand

680 employees

30

Research and development sites in Pharmaceuticals and Diagnostics worldwide

26

Manufacturing sites in Pharmaceuticals and Diagnostics worldwide

- Roche Group headquarters
- Largest sites based on number of employees
- Research and development sites in Pharmaceuticals and Diagnostics

- Manufacturing sites in Pharmaceuticals and Diagnostics
- Sales sites in Pharmaceuticals and Diagnostics
- * Number of employees expressed in full-time equivalents

Highlights

Supporting continued growth

With CHF 2.4 billion in sales—Ocrevus for two forms of MS most successful new product launch for Roche

+ Read more on page 33

Treating rare blood disorder

Hemlibra now indicated for most haemophilia patients in the US

+ Read more on page 35

Fighting influenza infections

Xofluza—first single-dose oral medicine to treat influenza approved in the US

+ Read more on page 36

Progressing Alzheimer's diagnosis

FDA breakthrough device designation for Elecsys assays to support early and improved diagnosis of Alzheimer's disease

+ Read more on page 29

Improving access to healthcare

Roche takes a lead role in the scale-up of the City Cancer Challenge 2025 to change global landscape of cancer care

+ Read more on page 61

Contributing to sustainability

Roche ranked most sustainable healthcare company in the Dow Jones Sustainability Indices for the tenth successive year

+ Read more on page 13

Key figures

CHF 56,846 million

Group sales +7%**

CHF 11,047 million

R&D core investments +6%

CHF 20,505 million

Core operating profit +9%

30 Roche medicines

on the WHO Model List of Essential Medicines

CHF 8.70

Dividend

127 million patients

treated with Roche medicines

** All growth rates in this report are at constant exchange rates (CER; average 2017).

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Our reporting approach

Roche is committed to transparent reporting and we endeavour to drive our economic, social and environmental performance with the same diligence as our financial performance.

Reporting scope and boundaries

Our financial and non-financial reporting consists of the Annual Report, the Finance Report and the online report. It contains the annual financial statements, consolidated financial statements and non-financial performance indicators. It covers all regions and divisions from 1 January to 31 December 2018. The financial reporting scope is defined and outlined in our Finance Report, and there have been no significant changes in scope in 2018 compared to 2017.

Reporting in accordance with the latest GRI guidelines

We have followed the GRI G4 guidelines (Global Reporting Initiative) since 2014. By using the GRI guidelines, we disclose the most critical impacts of our activities on the environment, society and the economy. As of the 2017 reporting period, we transitioned to the newly introduced GRI Standards, which are based on the key concepts and disclosures of the GRI G4 guidelines. We report in accordance with the standards at core level but also go beyond the requirements for core level for a number of indicators.

Risk management

Our Risk Management Policy sets out Roche's approach to identifying, analysing, managing and reporting internal and external risks and opportunities. We also identify business sustainability risks and opportunities on an annual basis and integrate these into our existing Group risk management process. Information about

our emerging sustainability risks and opportunities is provided on our risk management web page.

A consolidated Group Risk Report, which covers all material risks, is discussed annually with the Corporate Executive Committee and reviewed by the Audit Committee of the Board of Directors and by the Board of Directors. The effectiveness of the Group risk management process is regularly monitored by the Group Risk Advisory team, and the overall process is reviewed externally when appropriate. Risk management is embedded at all levels of the Group. Our Pharmaceuticals and Diagnostics Divisions and global functions conduct a formal risk assessment process at least once a year and must develop risk plans for their most material risks.

Group Risk Advisory facilitates risk discussions to support the business in many specialist areas such as IT security, as well as compliance and sustainability. Training sessions and platforms have been established to help employees manage, monitor and mitigate risks appropriately.

+ [Read more in 'Corporate Governance' on page 113](#)

External assurance

Our current Annual Report includes an independent assurance report on our non-financial reporting, prepared by PricewaterhouseCoopers AG.

+ [See 'Independent assurance report' on page 148](#)

Materiality

In accordance with the GRI Standards, we conducted a first materiality analysis at the corporate level in 2014 and gathered input and feedback through various internal and external sources, conferences, and by conducting regular interviews and one-on-one discussions with key stakeholders. These results have since been regularly vetted against ongoing stakeholder research across key markets and stakeholder groups. This enables us to include 21 topics from stakeholder groups that we consider important to our business and to the healthcare sector, such as patient organisations, physicians and laboratory staff, employees, media, investors, payers, regulators and governments.

In 2017, 21 material topics were screened against priorities deemed key to Roche in three tiers—firstly, fundamental drivers of our ability to deliver on our core purpose in the long term; secondly, additional annually reviewed major influencing factors for our business success in the short and medium term; and finally, all other material topics, providing three levels of priority in addressing material topics.

These three tiers and 21 material topics are reflected in our business priorities, in the report content (highlighted at the beginning of each chapter), as well as in aspect boundaries according to the GRI. We build concrete actions relating to these topics into operational activities, and measure performance through defined indicators.

We are currently conducting a second global materiality assessment. The results of this assessment will be published on our website in 2019 and will inform our strategy moving forward as well as the content of the 2019 Annual Report.

+ See 'Our strategy' on page 8

Our 21 material topics

Tier 1—Fundamental drivers of our ability to deliver on our core purpose in the long term

- R&D pipeline strategy and personalised healthcare
- Employee engagement and talent retention
- Growth strategy in emerging and developed markets
- Product portfolio strategy
- Patent policies
- Leadership Commitments

Tier 2—Major influencing factors for our business success in the short and medium term

- Pricing
- Disease awareness and treatment education
- Compliance
- Drug efficacy, safety and counterfeiting
- Supply chain management
- Biosimilar safety
- Sustainable healthcare

Tier 3—Additional material topics

- Executive remuneration
- Compensation/benefits
- Organisational effectiveness
- Environmental responsibility
- Community engagement
- Patient organisation support
- Data transparency on clinical trials
- Occupational accidents

Materiality:

roche.com/materiality

Key performance indicators:

roche.com/performance

Online Roche Annual Report 2018:

ar18.roche.com

Roche Annual Report 2018 (PDF):

roche.com/ar18e.pdf

Roche Finance Report 2018 (PDF):

roche.com/fb18e.pdf

Risk management:

roche.com/risk-management

Our commitment to the UN SDGs

As a global healthcare company, we are committed to supporting a number of the 17 United Nations Sustainable Development Goals (SDGs) in line with our business strategy; in particular SDG 3, which aims at ensuring healthy lives.

Our contribution to the UN SDGs:
roche.com/un-sdgs



With a history of more than 120 years,

we have a strong commitment to sustainability.

Supporting SDG

Innovating for patients

- **127 million patients** treated with Roche medicines
- **20 billion tests** conducted with Roche Diagnostics products
- **30 Roche medicines** on the WHO* Model List of Essential Medicines



Being a trustworthy partner

- **23 new partnerships** in Diagnostics
- **107 new partnerships** in Pharmaceuticals
- **100% of approximately 1,000 business-critical** suppliers risk-assessed



Protecting the environment

- **13% decrease** in water consumption since 2015
- **10% decrease** in energy consumption since 2015
- **23% improvement** in the eco-balance since 2014



Delivering continued growth

- **+7%** in Group sales**
- **+9% in core operating profit**
- **Sustainability leader** according to Dow Jones Sustainability Indices



Providing a great workplace

- **72% employee engagement rate*****
- **30% of key leadership positions** now held by women
- **22% of key leaders** with diverse work experience



* World Health Organization | ** All growth rates in this report are at constant exchange rates (CER; average 2017). | *** measured by the Global Employee Opinion

What we do

Our focus
Fitting treatments to patients

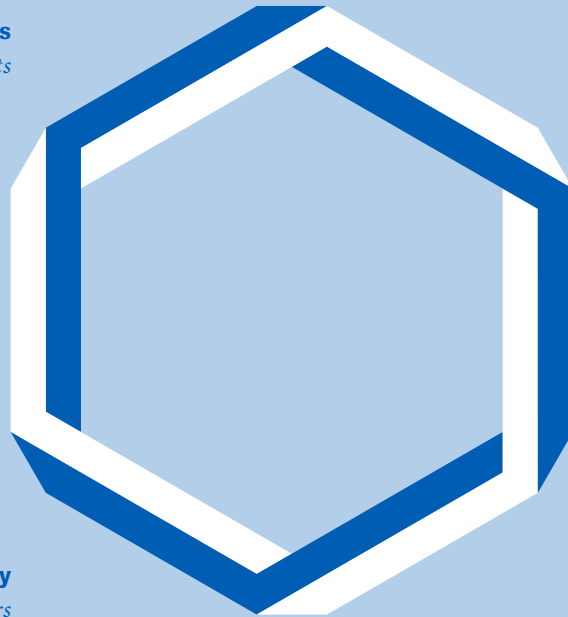
Our people
Making their mark

Our distinctiveness
Excellence in science

Our decision-making
Accountable and transparent

Our delivery
Value for all stakeholders

Our structure
Built for innovation



How we do it

Our strategy

We focus on finding new medicines and diagnostics that help patients live longer, better lives and evolve the practice of medicine.

We are guided by our purpose:

Doing now what patients need next.

Our company has a more than 120-year history of advancing the field of medicine and bringing novel treatments and diagnostics to patients. The patient is and will remain at the core of what we do, the reason we come to work every day.

What we do

Our focus is on fitting treatments to patients: providing the right therapy for the group of people that respond best at the right time. With our in-house combination of Pharmaceuticals and Diagnostics, we are uniquely positioned to deliver personalised healthcare. We are developing our internal capabilities and building strategic partnerships ready for the next stage in personalised healthcare: to combine insights from multiple data sources with sophisticated analytics to drive more effective and efficient research and allow for better therapeutic decisions for patients. Access to our products is also a critical part of our strategy. Our detailed access plans are embedded into the business at a local level.

We will continue to concentrate our energies entirely on prescription medicines and *in vitro* diagnostics, rather than diversify into other sectors like generics, biosimilars or over-the-counter medicines.

In our pursuit of excellence in science, **our distinctiveness** rests on four key elements: an exceptionally broad and deep understanding of

molecular biology, the seamless integration of our pharmaceuticals and diagnostics capabilities, a diversity of approaches to maximise innovation, and a long-term orientation.

Our delivery is to create value for all our stakeholders: being a partner of choice; bringing significant medical benefit for patients, doctors and payers; offering a great place to work for employees; delivering a sustainable positive contribution to society; and creating top-quartile total shareholder return for our investors.

How we do it

Ultimately, it takes people with integrity, courage and passion to make a difference for patients. It is **our people** who are proud to say: We are Roche. We embrace the diversity of cultures and people across the Group. We are inclusive and encourage the richness of ideas and approaches this brings.

Our decision-making principles and processes emphasise transparent dialogue, clear accountability, and encourage a high degree of empowerment.

Our structure is built for innovation. Our autonomous research and development centres and alliances with 220 external partners foster a diversity of scientific approaches and agility. Our global geographical scale and reach enables us to attract talent in the biggest global science clusters and to bring our diagnostics and medicines quickly to people who need them.

Personalised healthcare

Taking it to the next level—digitalisation triggers business transformation.

Digitalisation refers to the use of digital technologies to modify an existing business model. For life science companies, healthcare providers, patients and consumers, the use of digital technologies is believed to harbour significant potential for streamlining processes and helping achieve superior treatment outcomes.¹

Underlying this view are a number of recent developments. First, quality health data is becoming available in electronic form as new digital capabilities are becoming common practice. These include recording health data digitally, for example with low-cost mobile devices, thereby transforming existing records such as notes and images into a format suitable for machine learning, and curating data efficiently. The depth of this data is enhanced by novel data types and characteristics, for example genetic profiles, or consistent data across longer time periods. Second, tools for advanced analysis of large data volumes are emerging as advances in computing power, data handling and sophisticated analysis techniques are being adopted in healthcare.

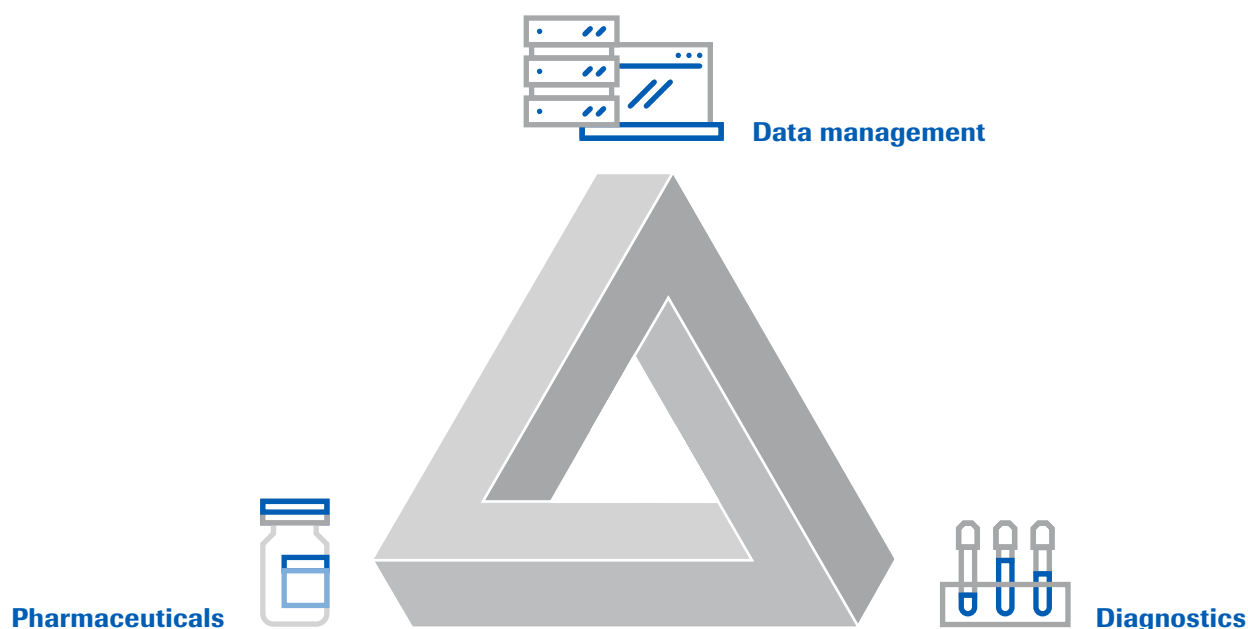
As a result, there has been an explosive growth of high-quality data that can be analysed and interpreted. Particularly, the data now accessible from routine clinical practice, captured in electronic medical records, often referred to as ‘real-world data’.

This is increasingly seen as a potentially rich and underutilised source to generate benefits in two ways: (a) The addition of insights derived from real-world data offers the prospect of taking personalised healthcare to the next level. Diagnosis and treatment will be highly tailored, both in terms of effectiveness and safety, to the individual’s unique condition; (b) linking clinical trial data and real-world data with the dramatic advances in biological and medical knowledge is expected to provide leads for more targeted research and efficient development processes.

Either way, this evolution will require partnerships between traditional players (healthcare providers, payers, life sciences experts and device manufacturers) as well as non-traditional entrants (retailers, telecommunications and technology companies, entrepreneurs and venture capital investors).²

Embedding digitalisation across the organisation

In Roche Pharmaceuticals, digitalisation is transforming the way medicines are developed, tested, and delivered to patients. It leverages the rapidly increasing volume of health-related data and diagnostic test results that are critical for the development of even more sophisticated medicines. In Roche Diagnostics, data-driven processes allow for optimised workflows in laboratories and medical decision-making, thus improving laboratory efficiency and treatment efficacy.



Personalised healthcare—the next level

In pursuing the next level of personalised healthcare, we are adding a third dimension to Roche's expertise in pharmaceuticals and diagnostics: data management. Roche is rapidly expanding its existing capabilities and is deploying these internally and externally. Here are three examples of how:

Large data sets allow for better insights

Through our partnerships with Foundation Medicine Inc., USA, (specialising in genetic profiling of cancer) and Flatiron Health (curating electronic medical records) we are building what we call 'meaningful data at scale'. We combine these datasets with our deep understanding of cancer diagnostics and treatment, and look for specific patterns. This ranges from determining the prevalence of cancer biomarkers to identifying potential 'druggable' targets. Such insights increasingly allow us to answer questions that could not be answered before, for example, about small patient populations, and provide more effective intervention options for cancer patients.

Understanding disease progression in MS

Personalised healthcare aims to improve outcomes for patients. In multiple sclerosis (MS), this means detecting disease progression earlier and developing tools that accelerate drug development.

MS is a progressive disease from the start. However, the ability to characterise and prognose individual disease course in the real-world is limited. With the introduction of smartphones and wearable technologies we all carry the ability to continuously track our own health.

Floodlight uses smartphone sensor-based measures to detect subtle changes in cognition and motor function, to develop novel measures of disease progression. It aims to empower people with MS with more information about their disease, give healthcare professionals tools to recognise progression, and fundamentally improve our understanding of MS and individualise patient care.

Support to manage increasingly complex data

The rapidly increasing wealth and complexity of data represent a formidable challenge for healthcare professionals. Roche's Navify Decision Support portfolio of fully integrated clinical workflow solutions and clinical decision support apps helps multidisciplinary care teams navigate the maze of medical information, using analytics to transform large amounts of data into actionable insights.



A year with strong
growth

Dear Shareholders,

Digitalisation is permeating ever more significant areas of our lives, and the healthcare sector is no exception. As Severin Schwan explains on pages 16 and 17, digitalisation presents tremendous opportunities for a research-based diagnostics and pharmaceuticals company such as Roche. We intend to leverage these opportunities so that we can provide even better diagnostic decision-making support to doctors and develop much-needed treatments in a faster and targeted way. Examples of our efforts include the now finalised transaction with Foundation Medicine and the acquisition of Flatiron Health in the United States. This has helped us improve our ongoing efforts in personalised healthcare.

Our latest medical innovations in particular are another reason for my optimistic outlook on Roche's future. Ocrevus, approved for multiple sclerosis (MS), has been the most successful product launch in Roche's history. It is effective in relapsing forms of MS as well as in cases where the patient's condition steadily worsens from the outset. Ocrevus is the first medicine ever to be approved for the primary progressive form of MS.

In view of increasing competition from biosimilars, it is particularly encouraging to note that our sales growth is being driven by our innovative new medicines such as Ocrevus, Perjeta (breast cancer), Tecentriq (cancer immunotherapy), Alecensa (lung cancer) and Hemlibra (haemophilia), as well as by our immunodiagnostics business, and is thus broadly supported.

Roche has one of the best product pipelines in the industry. In 2018 alone, we invested CHF 11 billion in its development. We are a leader in oncology, we have a growing number of neuroscience projects and immunology is performing well. Over the last six years, the US Food and Drug Administration granted breakthrough therapy designations to no fewer than 24 of Roche's active ingredients, six in 2018 alone. This is an achievement we are proud of.

Our strength in innovation is also reflected in our financial results. In 2018, Roche increased sales by 7%* to CHF 56.8 billion. IFRS net income rose by 24% to CHF 10.9 billion. Owing to this positive business performance, we will be proposing a dividend of 8.70 Swiss francs per share and non-voting equity

security at the Annual General Meeting on 5 March 2019. Subject to your approval, this will be the 32nd consecutive dividend increase.

I am also delighted with our nomination of Professor Dr Hans Clevers, professor of molecular genetics at the University Medical Center Utrecht, the Netherlands, for election to the Board of Directors. Professor Clevers is an outstanding scientist with great expertise and experience in medical research.

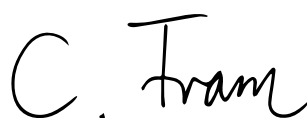
It is most gratifying to see that a sustainability mindset is embedded at all levels of the company. In 2018, Roche was recognised as Group Leader in sustainability within the Pharmaceuticals, Biotechnology & Life Sciences Industry index of the Dow Jones Sustainability Indices for the tenth consecutive year. I see this as a commitment to continue operating our business responsibly, holistically and with a long-term perspective. In doing so, our most important contribution to society is the development of medicines and diagnostics that significantly improve people's lives. Last year, some 20 billion tests were conducted with Roche analysers, while about 127 million patients worldwide benefited from our medicines.

Roche was one of the first companies to consolidate and complement its own research and development expertise by working with external partners. Worldwide we now have 220 partnerships with

other companies and universities. One recent example is the influenza medicine Xofluza. Initial research on this compound was carried out by the Japanese pharmaceuticals company Shionogi. It was subsequently developed by Roche in partnership with Shionogi. Xofluza received fast-track approval in the United States in October 2018. It is the first influenza treatment with a novel mechanism of action in almost 20 years.

With our focus on personalised healthcare, we aim to sustain our growth trajectory in 2019 as well. I am confident that by pursuing a strategy of systematic innovation based on medical and scientific progress, sustainable solutions and partnerships, Roche is well positioned for the future.

Many thanks to everyone who worked with us in 2018 on behalf of patients the world over. I thank our employees for their tireless efforts and achievements. And I offer you, our shareholders, my heartfelt thanks for the trust you have placed in us.



Dr Christoph Franz
Chairman of the Board of Directors

Board of Directors

Paul Bulcke (1954) B, E

Prof. Sir John Bell (1952) B, E

Bernard Pousot (1952) C, E

Anita Hauser (1969) A, E

Dr Andreas Oeri (1949)

Representative of the shareholder group with pooled voting rights, A*, E

André Hoffmann (1958)

Vice-Chairman, Representative of the shareholder group with pooled voting rights, A, C*, D, E

Dr Severin Schwan (1967) F

Dr Christoph Franz (1960) Chairman, C, D*, E

Dr Claudia Suessmuth Dyckerhoff (1967) A, B, E

Julie Brown (1962) B*, E

Prof. Dr Richard P. Lifton (1953) C, E

Peter R. Voser (1958) C, E

A Corporate Governance and Sustainability Committee

B Audit Committee

C Remuneration Committee

D Presidium/Nomination Committee

E Non-executive director

F Executive director

* Committee chairperson

Roche Board of Directors on 31 December 2018, in the midst of Roche apprentices







Data protection is in our DNA

Roche CEO Severin Schwan talks about the completely new opportunities opening up with digitalisation and the importance of trust in handling patient data.

What does digitalisation mean for Roche?

These technologies—combined with our expertise in medical science—have the potential to fundamentally improve and accelerate the way we do research, develop and sell medicines and diagnostic systems. We will continue to stand for diagnostics and medicines, but will also market an increasing number of digital solutions alongside these tangible products. The Pharmaceuticals and Diagnostics Divisions will experience the impact on our business model in different ways. For Pharmaceuticals, assessing data is

nothing new; it has always been part of the business. The division has always compiled clinical trial data as the basis for obtaining approvals for new medicines. What's new is that we no longer only evaluate data from clinical trials, but also data from clinical practice. The reason we can do so now is because these data are increasingly compiled and recorded electronically.

We're talking about Flatiron and FMI here.

That's right. By acquiring Flatiron and FMI, we have taken a quantum leap forward in terms of access to

data in oncology, even if both companies pursue their objectives independently. In addition, we have entered into a large number of partnerships with other companies and public institutions. But the Pharmaceuticals' business model has not changed fundamentally; it still focuses on the development and marketing of new and better medicines.

Roche is currently developing a monitoring app for Parkinson's disease. Is Roche now breaking into the app business?

I would prefer to say that we will be selling medicines for Parkinson's disease, and apps will be associated with that. They could be our own apps, but other companies might also develop suitable ones.

And in Diagnostics?

Diagnostics is undergoing a sea change in its business model. Until now, we sold instruments and tests, and our customers interpreted the data. Now, we also offer clinical decision support. This means that we aggregate data from our own, and other, systems so that we can supply relevant decision-making information to doctors and patients, like we do with the Navify Tumor Board. We are building a digital ecosystem that third-party companies will also be able to dock onto and provide apps for. That gives us a genuinely new business model.

What is Roche's position on data protection?

The concept that data need to be protected is in our DNA, and we have been putting data protection into practice in our clinical trials for decades. I regularly find that government agencies and hospitals are willing to partner with us because of our solid expertise in protecting patient data. Trust has a lot to do with it, and we need to take advantage of the lead that this trust gives us to substantially accelerate medical advances using the data volumes that are now

available. To achieve this, basically we want to work with anonymised data instead of accessing sensitive personal data. Thanks to powerful anonymisation processes, data utilisation does not contravene data protection. In this connection, we would like more legal certainty and clear regulations regarding the handling of such data.

People are still worried about data being misused.

New technologies always generate uncertainty. Just look back at the debate about genetic engineering in the 1990s. The current debate and concerns over data misuse are playing out along similar lines. Some of these concerns are justified and need to be taken seriously and managed, but it is important to keep negativity from dominating the equation. If genetic engineering technology had been banned back in 1998, the achievements in the life sciences industry would not have been possible. More than 70% of our medicines are produced by biotechnology.

Patients have benefited from genetic engineering. What will they gain from digitalisation?

Three things. First, new and better medicines. Real-world data enable us to see connections that we cannot see in classical clinical trial data. For example, we can spot new therapeutic targets for molecules, identify different subgroups within patient populations and, as a consequence, develop new medicines in a much more specific and effective way. Second, medicines are reaching the market faster because we can design clinical trials more efficiently and thus accelerate the approval process. Finally, digital decision-making aids will help to make treatments more targeted and efficient in everyday clinical practice, too. Helping patients and improving healthcare is what Roche is about. Digitalisation puts us on a much faster track to achieving personalised healthcare.

Corporate Executive Committee

Dr Stephan Feldhaus* (1962)
Head Group Communications

Dr Alan Hippe (1967)
Chief Financial and IT Officer

Dr William Pao* (1967)
Head Roche Pharma Research & Early Development (pRED)

Dr James H. Sabry* (1958)
Global Head Pharma Partnering

Dr Michael D. Varney* (1958)
Head Genentech Research & Early Development (gRED)

Dr Severin Schwan (1967)
CEO Roche Group

Daniel O'Day (1964)
CEO Roche Pharmaceuticals

Cristina A. Wilbur (1967)
Head Group Human Resources

Dr Michael Heuer (1954)
CEO Roche Diagnostics a. i.

Dr Gottlieb A. Keller (1954)
General Counsel

* Member of the Enlarged Corporate Executive Committee
Roche Corporate Executive Committee on 31 December 2018, in the midst of Roche apprentices







Roche showed a very strong

business performance

The uptake of our new medicines continued to be very strong throughout the year.

8 DECENT WORK AND
ECONOMIC GROWTH



Stringent quality controls ensure that our products provided to patients meet all the respective production criteria.

Very strong results in **both divisions**

Strong growth of our new products characterised the year 2018. Based on this performance, Roche is well positioned for future growth.

In 2018, Group sales rose 7%* to CHF 56.8 billion. Core operating profit increased 9%, reflecting the strong underlying business performance. Core EPS grew 19% and IFRS net income increased 24%, including the benefits from the US tax reform and higher net financial income.

Sales in the Pharmaceuticals Division increased 7% to CHF 44.0 billion. Key growth drivers were the new medicine Ocrevus, used to treat two forms of multiple sclerosis (MS), and cancer medicines Perjeta, Tecentriq, Alecensa and Hemlibra to treat haemophilia. As expected, the strong uptake of newly introduced medicines was partially offset by lower sales of MabThera/Rituxan and Tarceva.

In the US, sales increased 14%, led by Ocrevus, Perjeta and Lucentis.¹ In Europe (-7%), sales were affected by competition from biosimilars for MabThera/Rituxan (-47%) and Herceptin (-16%), partially offset by the strong launches of our new medicines Ocrevus, Tecentriq, Alecensa, and of Perjeta.

In the International region, sales grew 10%, led by the Asia-Pacific and Latin America subregions. In Japan, sales declined 1% due to government price cuts and biosimilar competition.

Diagnostics Division sales increased 7% to CHF 12.9 billion. Centralised and Point of Care Solutions (+8%) was the main contributor, led by the growth of its immunodiagnostics business (+11%). Sales increased in all business areas. In regional terms, growth was driven by Asia-Pacific (+13%) and North America (+7%). Sales increased 3% in EMEA, 9% in Latin America, and 6% in Japan.²

Drug approvals and expedited reviews

The US Food and Drug Administration (FDA) granted several approvals, including: Tecentriq, in combination with Avastin, paclitaxel and carboplatin (chemotherapy), for the initial treatment of people with metastatic non-squamous non-small cell lung cancer (NSCLC) with no EGFR or ALK genomic tumour aberrations; MabThera/Rituxan for

Material topics covered in this chapter

Product portfolio strategy

Growth strategy in emerging and developed markets

pemphigus vulgaris; Avastin for a form of ovarian cancer; Hemlibra for people with haemophilia A without factor VIII inhibitors; and Xofluza (baloxavir marboxil) for the treatment of acute, uncomplicated influenza in people aged 12 years and older.

European Medical Agency (EMA) approvals include Ocrevus for MS, Hemlibra for people with haemophilia A with inhibitors to factor VIII, and Perjeta for adjuvant treatment of HER2-positive early breast cancer at high risk of recurrence.

In China, the National Drug Administration approved Alecensa for the treatment of ALK-positive NSCLC.

The FDA granted priority review for Tecentriq plus chemotherapy (albumin-bound paclitaxel) for the initial (first-line) treatment of unresectable locally advanced or metastatic triple-negative breast cancer (TNBC) in people whose disease expresses the PD-L1 protein, as determined by PD-L1 biomarker testing.

Health authorities in the US, EU and Japan granted expedited reviews for entrectinib (more on page 37).

The EMA granted PRIME designation for RG6042 for the treatment of Huntington's disease and for the investigational oral medicine risdiplam for the treatment of people with spinal muscular atrophy.

Diagnostics: data management and decision support

To support healthcare providers who need to manage ever-growing amounts of data from diverse sources,

Roche Diagnostics has introduced new products and services and announced key partnerships.

Through the strategic partnership with GE Healthcare, we combine our *in vitro* diagnostics with GE Healthcare's *in vivo* expertise. We will co-develop and co-market decision support software solutions, anchored by a shared digital platform. This is designed to also allow third parties to potentially place their product- and company-agnostic applications.

In 2018, the Navify Clinical Trial Match and Navify Publication Search apps were launched. These apps scan globally renowned resources and are fully integrated with the Navify Tumor Board.

Viewics, Inc., one of our data analytics platforms, launched its first two solution applications—Viewics LabOPS and Viewics Dx Optimization—to support better productivity, decision-making and clinical care for laboratories and hospitals.

cobas pro integrated solutions, a Serum Work Area solution for medium- to lower high-throughput laboratories, was launched in countries accepting the CE mark.

Outlook for 2019

Sales are expected to grow in the low- to mid-single digit range, at constant exchange rates. Core earnings per share are targeted to grow broadly in line with sales, at constant exchange rates. Roche expects to further increase its dividend in Swiss francs.

* All growth rates in this report are at constant exchange rates (CER; average 2017). | 1 US Food and Drug Administration prescribing information for Perjeta |

2 EMEA = Europe, Middle East and Africa



Diagnostics Division Sales up 7%

With its products and services Roche Diagnostics supports healthcare providers in transforming data into actionable insights. We also help laboratories around the world to succeed in an increasingly complex and rapidly changing healthcare environment.

Sales in the Diagnostics Division grew strongly (+7%)* to CHF 12.9 billion, with growth reported in all regions and business areas.

Centralised and Point of Care Solutions (+8%) was the largest contributor to the division's sales growth. Serum Work Area solutions, comprising the immunodiagnosics (+11%) and clinical chemistry (+7%) businesses, were the main growth drivers. The Centralised and Point of Care Solutions business expanded, especially in Asia-Pacific due to sales growth in China, and in North America.

cobas pro integrated solutions, a Serum Work Area solution for medium- to lower high-throughput laboratories, was launched in countries accepting the CE mark.

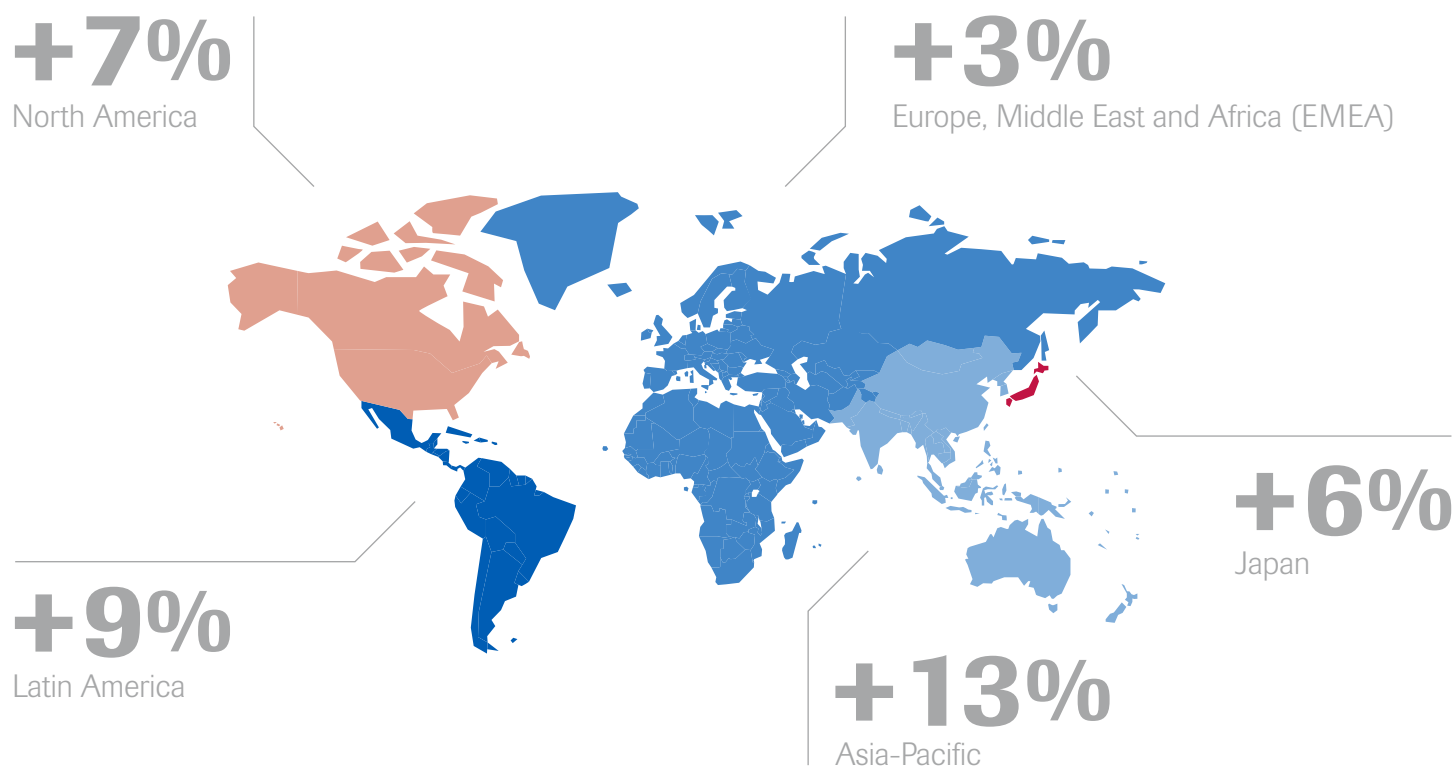
Sales in **Molecular Diagnostics** increased 5%. In virology, sales were up 4%. Sales in the blood screening and human papillomavirus (HPV)

businesses grew 9% and 8%, respectively. Continued high demand was reported for cobas Liat tests, the new system for molecular point-of-care testing. Regional growth was led by EMEA and North America.

The cobas Dried Blood Spot test for qualitative early infant diagnosis and the cobas Plasma Separation Card for quantitative viral load testing for use on the cobas 4800 were launched, further improving access to HIV diagnosis in remote areas.

Tissue Diagnostics sales increased 10%. The advanced staining business continued its strong growth (+10%); demand for the primary staining portfolio was high (+13%). Regionally, growth was led by North America and EMEA. Growth in Asia-Pacific was driven by China.

The Ventana DP 200 slide scanner was launched early in 2018, creating high-quality tissue slide



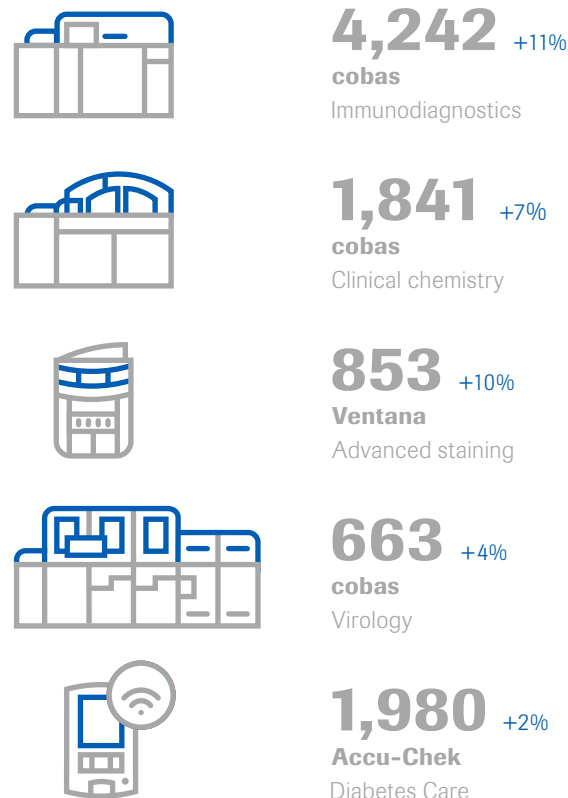
The Asia-Pacific region was again the division's main growth driver.

images that offer pathologists a digital image that accurately reproduces what would be seen under the microscope. These images serve as the basis for a full menu of image analysis algorithms currently under development. Roche also launched uPath enterprise software, a universal digital pathology software application for lab administrators, histotechnicians and pathologists. It enables pathologists with patient-centric case viewing for quick diagnosis.

Diabetes Care sales increased 2%, mainly driven by the new Accu-Chek Guide and Accu-Chek Instant systems. Sales growth was reported in North America and Latin America and in Asia-Pacific.

Launched in pilot markets, the new Accu-Chek Solo micropump received encouraging customer feedback. An enhanced positive acceptance is visible for the integrated diabetes management solutions including mySugr.

Top-selling product portfolios in 2018 (CHF millions)



* All growth rates in this report are at constant exchange rates (CER; average 2017).

Delivering medical value to a digital world

In this era of digital technology, we are increasingly able to tailor medical treatments to the needs of individuals. Far more information is being captured, stored and analysed, revealing how diseases manifest themselves and how patients experience them from day to day. Our deepening understanding of molecular science, together with new diagnostic tools and data management methods, is bringing disruptive changes to patient care.

Our holistic approach to digital transformation extends well beyond technology, addressing the entire customer experience, encompassing our product portfolio and resulting in new ways of working. At Roche Diagnostics, this transformation of our business is well underway, enabling us to become a leader in digital diagnostics while remaining the global leader in *in vitro* diagnostics.

We are one of the largest providers of real-world data, and produce billions of test results every year. In 2018, the total exceeded 20 billion results. We have more than 100 digital technology and data initiatives already underway. We are committed to delivering digital solutions and services—in addition to our industry-leading diagnostics portfolio—that offer enhanced and broader customer experiences and help to improve the lives of patients around the world.

In March, we launched the Ventana DP 200 high-speed slide scanner for digital pathology. Its unique tray-based design enables no-touch slide processing for reduced workflow errors. It provides reliable, high-speed scanning of histology slides with excellent image quality and reliability, setting a new standard for digital pathology and providing a foundation for

a future menu of Roche image analysis algorithms. The scanner is CE-marked for *in vitro* diagnostic use and is available in the US for research use only.

In October, we officially opened our new manufacturing site and R&D centre in Suzhou, China, to support the future diagnostic needs in China and the region. With our regional headquarters in Singapore and eight existing branches across China, we are already a major healthcare provider in Asia-Pacific. Rapid population growth coupled with the changing landscape in high-end manufacturing has encouraged us to expand our global manufacturing expertise locally.

Transforming data into actionable insights: decision support

As medical knowledge increases at an exponential rate, healthcare providers need to manage ever-growing amounts of data from diverse sources such as electronic health records, doctors' notes, clinical trials and diagnostic instruments.

At Roche, we understand that confident decision-making in clinical practice only happens when human medical knowledge and digital medical knowledge come together seamlessly. With the Diagnostics and Pharmaceuticals Divisions working together under one roof and combining our profound understanding of diseases, diagnostics and treatment, we are uniquely positioned to tackle the challenges of vast and complex sources of data. And working with our external partners, we are developing new solutions that make the best use of data to enable smarter, more efficient research and development and better patient care overall.



In 2018, our industry-leading portfolio of integrated diagnostic solutions grew significantly, with several product launches in the US and in Europe.

In early 2018, Roche Diagnostics and GE Healthcare announced their agreement to enter into a strategic partnership, combining our *in vitro* diagnostics with GE Healthcare's *in vivo* expertise. We will co-develop and co-market decision support software solutions, anchored by a shared digital platform designed to also allow third parties to potentially place their product- and company-agnostic applications. The initial focus is on oncology and acute care.

We continue to develop our Navify Decision Support portfolio, launched in 2017, to help multidisciplinary care teams navigate increasingly complex medical information. The first commercially available product—Navify Tumor Board—is a cloud-based software solution that fundamentally changes the way oncology care teams prepare for, conduct and document clinical treatment decisions.

Together with GE Healthcare, we will introduce Navify Tumor Board v2.0, which offers a deeper

integration of imaging and imaging analytics. This means the product will be capable of integrating Roche's *in vitro* diagnostic data (eg, biomarkers, tissue pathology, genomics) and *in vivo* diagnostic data provided by GE Healthcare (eg, medical imaging) together with other patient information.

The September launch of the first two Navify Clinical Decision Support apps underlined our strategy and marked a next step towards more personalised healthcare. The Navify Clinical Trial Match and Navify Publication Search apps scan globally renowned resources and are fully integrated with the Navify Tumor Board. The apps represent the start of the Navify app ecosystem, with more apps from Roche, partners and third parties to follow.

Viewics, Inc., one of our data analytics platforms, launched its first two solution applications to support better productivity, decision-making and clinical care for laboratories and hospitals.

2,200

tests per hour



cobas pro integrated solutions—starting point of a new generation of Serum Work Area solutions—seamlessly integrated into the Roche Integrated Core Lab.

In October, the Viewics LabOPS application was rolled out to customers in most regions, with Asia-Pacific following soon. Viewics LabOPS offers easy-to-use dashboards and reports about the data in our customers' lab or hospital operations. The Viewics Dx Optimization module also features a suite of dashboards and reports designed to optimise physician ordering protocols and is available in the US and Canada.

Empowering laboratories with innovation and efficiency

By enabling continuous access to advanced and innovative diagnostics, we help laboratories around the world succeed in an increasingly complex and rapidly changing healthcare environment. The

Roche Integrated Core Lab (ICL) vastly expands the efficiency, scope and quality of diagnostic capabilities in the laboratory. And in 2018, our industry-leading portfolio of integrated diagnostic solutions grew significantly, with several product launches in the US and in Europe.

In February, we received FDA clearance for the cobas Factor II and Factor V test on the cobas 4800 system, providing a rapid workflow to aid in the diagnosis of patients with suspected thrombophilia. The test enables laboratories to simultaneously assess factor II and factor V gene mutations from a single patient sample, which can reduce hands-on time when testing patients for inherited thrombophilia. The test expands on the current menu of the cobas 4800 system, enabling labs to consolidate genomics, oncology, microbiology and virology testing onto a single platform. The new test also complements the recent CE approval of cobas t 511 and cobas t 711 coagulation analysers for the central lab, making Roche a key partner for laboratories performing coagulation and thrombophilia testing. The efficient test design allows laboratories to report up to 94 patient samples—and 188 results—per 90 minutes.

In April, we received 510(k) clearance (a premarket submission made to the FDA) for cobas CT/NG assay for use on the cobas 6800/8800 systems for the direct detection of *Chlamydia trachomatis* (CT) and/or *Neisseria gonorrhoeae* (NG) DNA in both symptomatic and asymptomatic individuals. The cobas CT/NG assay helps labs handle increasing testing volumes with the highest-throughput solution currently on the market.

In July, the FDA granted breakthrough device designations for our Elecsys β -Amyloid (1–42) CSF and Elecsys Phospho-Tau (181P) CSF tests. These *in vitro* diagnostic immunoassays measure the β -amyloid (1–42) and phospho-tau concentrations in cerebrospinal fluid (CSF) in adult patients with cognitive impairment who are being evaluated for Alzheimer's disease (AD) or other causes of dementia. Diagnosis of AD has been largely based on clinical symptoms, including cognitive testing, with a significant number of patients diagnosed when their disease has already advanced. Biomarker-based testing is expected to lead to greater diagnostic certainty and contribute to the search for effective treatment.

Our next-generation sequencing (NGS) portfolio continues to grow, and in October, three new NGS Avenio Tumor Tissue Analysis Kits were launched globally. These research-use-only (RUO) kits—the Avenio Tumor Tissue Targeted Kit, Expanded Kit and Surveillance Kit—detect all four mutation classes in solid tumours and complement our NGS ctDNA kits for oncology research. The Avenio RUO portfolio of ready-to-use kits provides reagents and software needed by labs to determine the genomic characteristics of solid tumours through a single DNA workflow.

In December, we launched the cobas pro integrated solutions for laboratories with medium- to high-throughput Serum Work Area (SWA) testing. This new generation of SWA solutions offers a high level of efficiency with a throughput of up to 2,200 tests

per hour and continuous loading of supplies. Furthermore, it offers simplicity through automated maintenance and calibration. It also features the broadest SWA assay menu consolidated on a single platform, short assay incubation times and low sample volume requirements.

In our Diabetes Care business, we are implementing our strategy to offer integrated diabetes management solutions; connecting physical products including blood glucose meters and test strips with digital solutions and services. In July, we received the CE-mark for the Accu-Chek Solo micropump and began launching in the first markets. As we are creating an open ecosystem of products and solutions that include our own as well as third-party solutions, we have signed important data-sharing agreements with Novo Nordisk and Senseonics. In June, we entered into a collaboration agreement with Care Innovations, a telehealth solution provider. Under the agreement, Care Innovations' customers based in the US and Canada will be offered the mySugr app, which allows people with diabetes to receive advice from certified diabetes educators. Customers will also have an Accu-Chek Guide blood glucose meter and test strips delivered directly to their homes.

This integration of insulin dosage and continuous glucose monitoring data with our digital solutions, including mySugr, will help create insights based on data. These personalised solutions aim to improve therapy outcomes for patients, thereby benefiting healthcare professionals and payers, too.



Ilka Gdanietz, mySugr, Austria

“As long as there is an impact, I cannot imagine doing anything else.”

I have type 1 diabetes and have lived with it since the age of ten. Diabetes is a data-driven disease. I have to handle so many numbers every day, like my blood glucose levels, my carb intake, calculate the right amount of insulin units to take, and the list just goes on. As a person living with diabetes, you have to make about 50 therapy decisions a day all on your own. That sucks! It can be really exhausting, time-consuming and frustrating.

I have been working at mySugr since 2012. mySugr aims to offer all-round care for people with diabetes, and the open app solution specialises in coaching and automated data tracking. Since 2017, mySugr has been part of the Roche Group. The work we do here is to help make living with diabetes less burdensome. We understand the pain well as a third of my co-workers also live with type 1 diabetes. We not only develop features in the app that take into account practical issues around our lives, but do this by getting views of patients on board at an early stage. Our goal is to take away as many therapy-related tasks as possible from the patient.

I grew up with diabetes in the days when blood glucose meters were much bigger, a test took over two minutes, and I had to take insulin shots eight times a day. In addition, I had to keep a handwritten logbook of my records, which was a mess. But times have changed, and so has diabetes care with all the digital transformation that is happening around us.

Nowadays I wear a pump that constantly delivers insulin to my body. I have an implanted sensor under my skin that sends my glucose readings in real time to my smartphone and smartwatch, which are connected to my app, which is mySugr. This stores all my relevant diabetes data in one place and even lets me know when it detects a certain pattern in my blood glucose readings to which I need to pay extra attention.

What I expect from the healthcare industry is not only the development of products and services that keep us alive, but also that make our lives easier and hopefully give us a good quality of life. I am convinced that digitalisation will have a big role to play in this.

I take an active role in raising awareness about my condition. Since 2008, I have been writing one of the best-known diabetes blogs in Germany and have also been getting increasingly involved in patient advocacy. Together with a colleague, I moderate a diabetes patient event every year which draws about 500 participants.

Living with diabetes, working in a company focused on diabetes, and spending most of my free time on diabetes-related projects and advocacy may sound a bit weird. But as long as there is an impact, I cannot imagine doing anything else.



Pharmaceuticals Division

Sales up 7%

With total sales of CHF 2.4 billion in its first full year on key markets, Ocrevus is the most successful new product launch in Roche's history.

Sales in the Pharmaceuticals Division increased 7%* to CHF 44.0 billion; new medicines contributed almost all growth.

Herceptin, Perjeta and Kadcyla (combined +7%). For HER2-positive breast cancer and HER2-positive metastatic gastric cancer (Herceptin only). Herceptin sales increases (+1%) were mainly driven by growth in the US and in China. In Europe (-16%) and Japan (-16%), sales were affected by biosimilars.

Avastin (+3%). For advanced colorectal, breast, lung, kidney, cervical and ovarian cancer and relapsed glioblastoma (a type of brain tumour). Sales increased in the International region (+12%), in the US (+1%) and in Japan (+3%), but declined in Europe (-1%).

MabThera/Rituxan (-8%). For forms of blood cancer, rheumatoid arthritis and certain types of vasculitis. Sales development was impacted in Europe (-47%) and Japan (-36%) by biosimilar competition.

Sales grew in the US (+4%) and in the International region (+11%), particularly in China.

Actemra/RoActemra (+12%). For rheumatoid arthritis, forms of juvenile idiopathic arthritis and giant cell arteritis as well as CAR T-cell-induced severe or life-threatening cytokine release syndrome. Sales increased in all regions, driven by the US.

Xolair (+11%, US only). For chronic idiopathic urticaria and allergic asthma. Growth was driven by demand in both indications.

Lucentis (+18%, US only). For eye conditions including neovascular ('wet') age-related macular degeneration, macular oedema following retinal vein occlusion, diabetic macular oedema and diabetic retinopathy. Growth was driven by sales of prefilled syringes and sales increases in all approved indications.

Highlights on medicines launched since 2012

Perjeta. For HER2-positive breast cancer. Sales (CHF 2.8 billion, +27%) grew in all regions. As of December 2018, Perjeta was registered in 73 countries for adjuvant treatment. This indication strongly supports its continued growth, which is also driven by increased demand in the adjuvant eBC (US) and the neoadjuvant metastatic settings in Europe.

Ocrevus (CHF 2.4 billion, +172%). For the treatment of relapsing (RMS) and primary progressive (PPMS) forms of MS. Growth was driven by new patients and patients requesting follow-up therapy alike.

Esbriet (CHF 1.0 billion, +19%). For idiopathic pulmonary fibrosis (IPF). Sales continued to expand, driven by growth in the US (+19%).

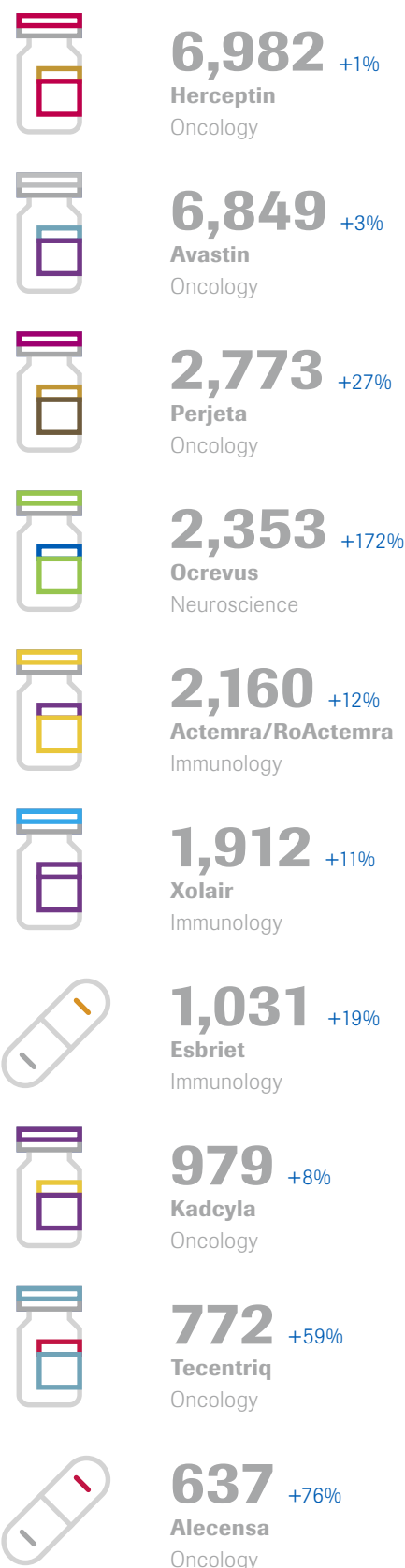
Tecentriq (CHF 772 million, +59%). For advanced bladder cancer, advanced lung cancer and initial therapy of non-squamous NSCLC. Growth was driven by post-launch uptake in Europe and launch in Japan.

Alecensa (CHF 637 million, +76%). For ALK-positive NSCLC. Alecensa showed continued strong sales growth across all regions.

Gazyva/Gazyvaro (CHF 390 million, +40%). For chronic lymphocytic leukaemia (CLL), rituximab-refractory follicular lymphoma and previously untreated advanced follicular lymphoma. Sales expanded, especially in Europe and in the US.

Hemlibra (CHF 224 million). Hemlibra is approved for people with haemophilia A with inhibitors to factor VIII in more than 50 countries, including the US, the EU, Australia and Japan. Hemlibra is also approved for people with haemophilia A without factor VIII inhibitors in the US and other countries.

Key growth-drivers in 2018 (CHF millions)



* All growth rates in this report are at constant exchange rates (CER; average 2017).

Rejuvenating our portfolio

New options for patients

Our new medicines, including Ocrevus, Perjeta, Tecentriq, Alecensa and Hemlibra, saw continued and very strong uptake in multiple markets.

With sales of CHF 2.4 billion in its first full year on key markets, **Ocrevus** has been the most successful new product launch in Roche's history. In addition to it having been met with extremely positive responses in new markets during 2018, the vast majority of patients with both forms also returned for follow-up treatment with this twice-a-year medication. Strong demand in both indications has continued. Five-year data showed that the efficacy of Ocrevus is maintained on key measures of disease activity, and that people with MS treated earlier with Ocrevus had superior disability progression outcomes compared with RMS patients who switched from interferon beta-1a or PPMS patients who switched from placebo.¹ Longer-term safety data continue to show a favourable risk-benefit profile.

Ocrevus has now been approved in 74 countries, with more than 80,000 people treated globally as of December 2018.

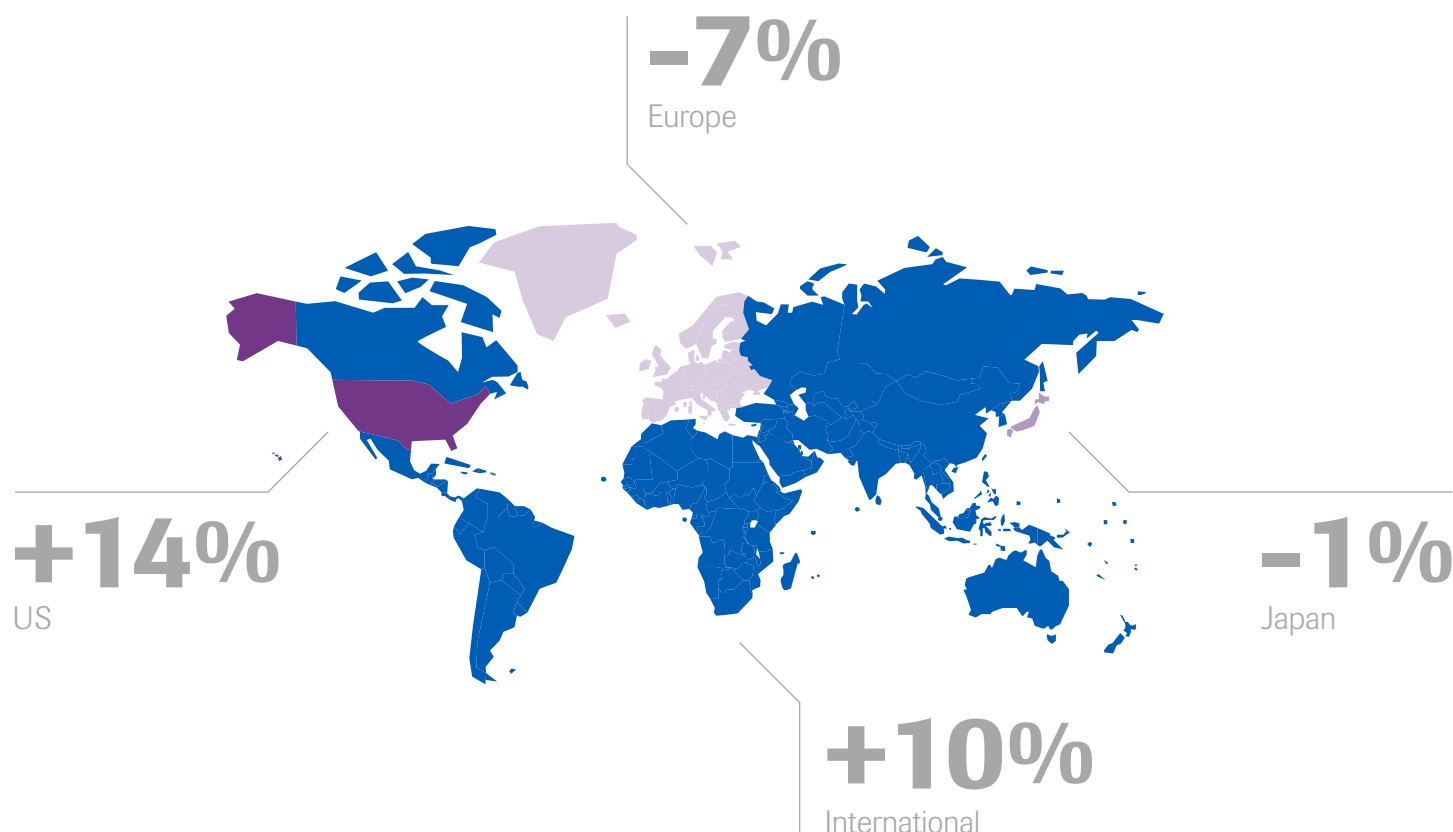
Perjeta, representing a major advance for the treatment of patients with breast cancer, generated total sales of CHF 2.8 billion. Launched in 2012, its usage continues to broaden as study results confirm its medical benefits in additional indications, including results of the phase III Aphinity study for adjuvant treatment of HER2-positive early breast cancer in patients who are at high risk of recurrence.

Results from the phase III Alex and J-Alex studies on **Alecensa** added to a wealth of evidence that supported the first-line use of Alecensa in multiple patient populations within ALK-positive NSCLC. This was followed by rapid worldwide regulatory approvals. Recently announced results of the third head-to-head phase III Alesia study of Alecensa versus crizotinib in an Asian patient population with ALK-positive advanced or metastatic NSCLC reinforce the findings of the Alex and J-Alex studies, showing a reduction in the risk of disease worsening or death by 78%. Alecensa lowered the risk of tumour spread or growth in the brain or central nervous system by 86%.²

In 2018, Alecensa was approved in China for ALK-positive advanced NSCLC, just eight months after approval in Europe.

In 2018, strong data were announced from **Tecentriq** studies in triple-negative breast cancer (TNBC) and extensive-stage small cell lung cancer.

Positive results were announced from the phase III IMpassion130 study of Tecentriq plus chemotherapy (*nab*-paclitaxel) for the initial (first-line) treatment of unresectable locally advanced or metastatic TNBC—the first positive phase III immunotherapy study in TNBC, an aggressive disease with limited treatment options. The Tecentriq and chemotherapy combination significantly reduced the risk of disease worsening or death (progression-free survival; PFS) compared with chemotherapy alone in the intention-to-treat and the PD-L1-positive population, a subgroup determined



● Eastern Europe, Middle East and Africa, Latin America, Asia-Pacific and Canada form the 'International' region.

by PD-L1 biomarker testing, and showed an encouraging overall survival benefit in the PD-L1-positive population at interim analysis.

Positive results from the phase III IMpower133 study of Tecentriq plus carboplatin and etoposide (chemotherapy) for the initial (first-line) treatment of people with previously untreated extensive-stage small cell lung cancer showed that Tecentriq and chemotherapy helped people live significantly longer compared with chemotherapy alone in the intention-to-treat population. The combination based on Tecentriq also significantly reduced the risk of disease worsening or death compared with chemotherapy alone.

Hemlibra is approved for people with haemophilia A with inhibitors to factor VIII in more than 50 countries. These approvals have transformed medical practice

in the treatment of haemophilia. In 2018, Hemlibra also gained US FDA approval for people with haemophilia A without factor VIII inhibitors. Together with previous approvals, this new medicine is now indicated for most haemophilia patients in the US, along with three dosing regimens for subcutaneous treatment: once weekly, every two weeks or every four weeks. Data from the Haven 3 and Haven 4 studies, which supported this approval, are under review by the European Medicines Agency.

Results from the **Kadcyla** phase III Katherine study for patients with HER2-positive early breast cancer (eBC) showed that treatment with Kadcyla as a single agent led to a significant reduction in the risk of disease recurrence or death, compared to Herceptin as an adjuvant (after surgery) treatment in people with HER2-positive eBC who have residual disease present following neoadjuvant (before surgery) treatment.

Approvals and expedited reviews

In December, the FDA approved **Tecentriq** in combination with Avastin, paclitaxel and carboplatin (chemotherapy) for the initial (first-line) treatment of people with metastatic non-squamous non-small cell lung cancer (NSCLC) with no EGFR or ALK genomic tumour aberrations.

In October 2018, the FDA approved **Xofluza** for the treatment of influenza infection. Xofluza is a first-in-class, single-dose oral medicine with a novel proposed mechanism of action. It is approved for the treatment of acute, uncomplicated influenza in people aged 12 years and older. It has demonstrated efficacy against a wide range of influenza viruses, including oseltamivir-resistant strains and avian strains (H7N9, H5N1) in non-clinical studies.

The FDA also granted approval for **MabThera/Rituxan** for the treatment of adults with moderate to severe pemphigus vulgaris, a rare, serious, life-threatening condition characterised by progressive, painful blistering of the skin and mucous membranes.

This is the first biologic therapy approved by the FDA for pemphigus vulgaris and the first major advancement in the treatment of the disease in more than 60 years.

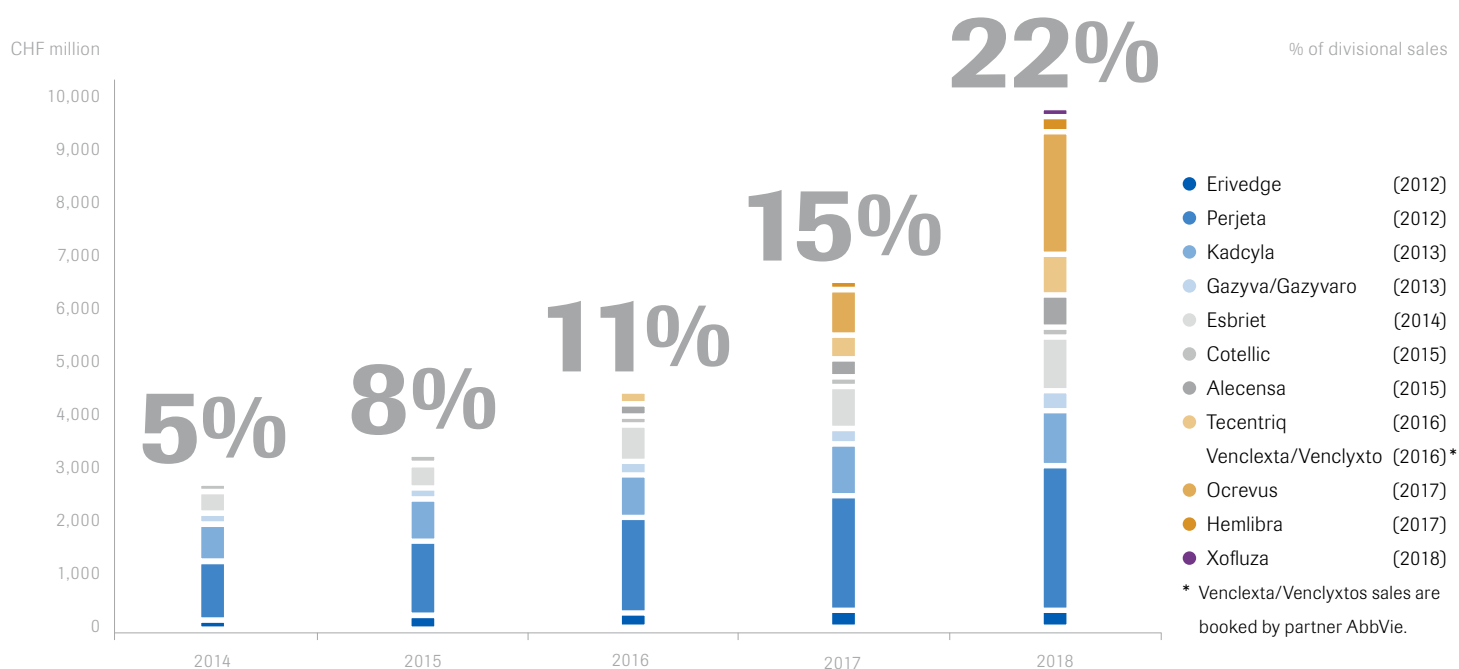
Additionally, approvals were granted by the FDA for the subcutaneous formulation of **Actemra/RoActemra** for a form of juvenile idiopathic arthritis and **Avastin** for a form of ovarian cancer.

Expedited review status

The FDA granted priority review status for **Tecentriq** plus chemotherapy (*nab*-paclitaxel) for the initial (first-line) treatment of unresectable, locally advanced or metastatic TNBC in people whose disease expresses the PD-L1 protein, as determined by PD-L1 biomarker testing. In July, the FDA granted breakthrough therapy designation for Tecentriq in combination with Avastin as a first-line treatment for people with advanced or metastatic hepatocellular carcinoma based on an ongoing phase Ib study. IMbrave150, a phase III study, is ongoing.

The European Medicines Agency (EMA) has granted PRIME (PRIority MEDicines) designation for the company's investigational medicine **RG6042** (formerly known as IONIS-HTTRx) for the treatment of people with Huntington's disease and for the investigational oral medicine **risdiplam** (RG7916) for the treatment of people with spinal muscular atrophy.

Almost all
of the division's growth is driven by new products.



The percentage of sales contribution of medicines launched since 2012 increased steadily.

Entrectinib has been granted expedited review status by the three major regulators: the US (FDA breakthrough therapy designation), the EU (EMA PRIME designation) and Japan (Japanese Ministry of Health, Labour and Welfare Sakigake and orphan drug designations). Entrectinib is in development for the treatment of NTRK fusion-positive, locally advanced or metastatic solid tumours in adult and paediatric patients whose cancer has progressed following prior therapies or have no acceptable standard therapies.

Advancing personalised healthcare

In April 2018, Roche completed the acquisition of Flatiron Health. This acquisition will help combine the efforts of two companies committed to improving

the lives of cancer patients by making optimal use of healthcare data and analytics. The partnership will leverage this combined expertise to advance the use of real-world evidence and set new industry standards for oncology research and development.

In late July 2018, Roche completed the transaction to take 100% ownership of Foundation Medicine, Inc. (FMI), US. This transaction will accelerate comprehensive genomic profiling in oncology by making FMI's high-quality, comprehensive genomic profiling testing and innovative data services more commonly available. Together, the companies will leverage their expertise in genomics and molecular information to enhance the development of personalised medicines and care for patients with cancer.



Gehad Refky, Roche, Egypt

“It is my partner for life. We have got to know each other well.”

I was just ten months old when doctors told my parents that I had haemophilia. Never did I imagine that one day through my work I would be able to help others like me. My personal experiences are an advantage, but more importantly a responsibility and a challenge. Being a person with haemophilia myself, I know only too well the burden of the disease, how much of a nuisance it can be, and how debilitating the complications are.

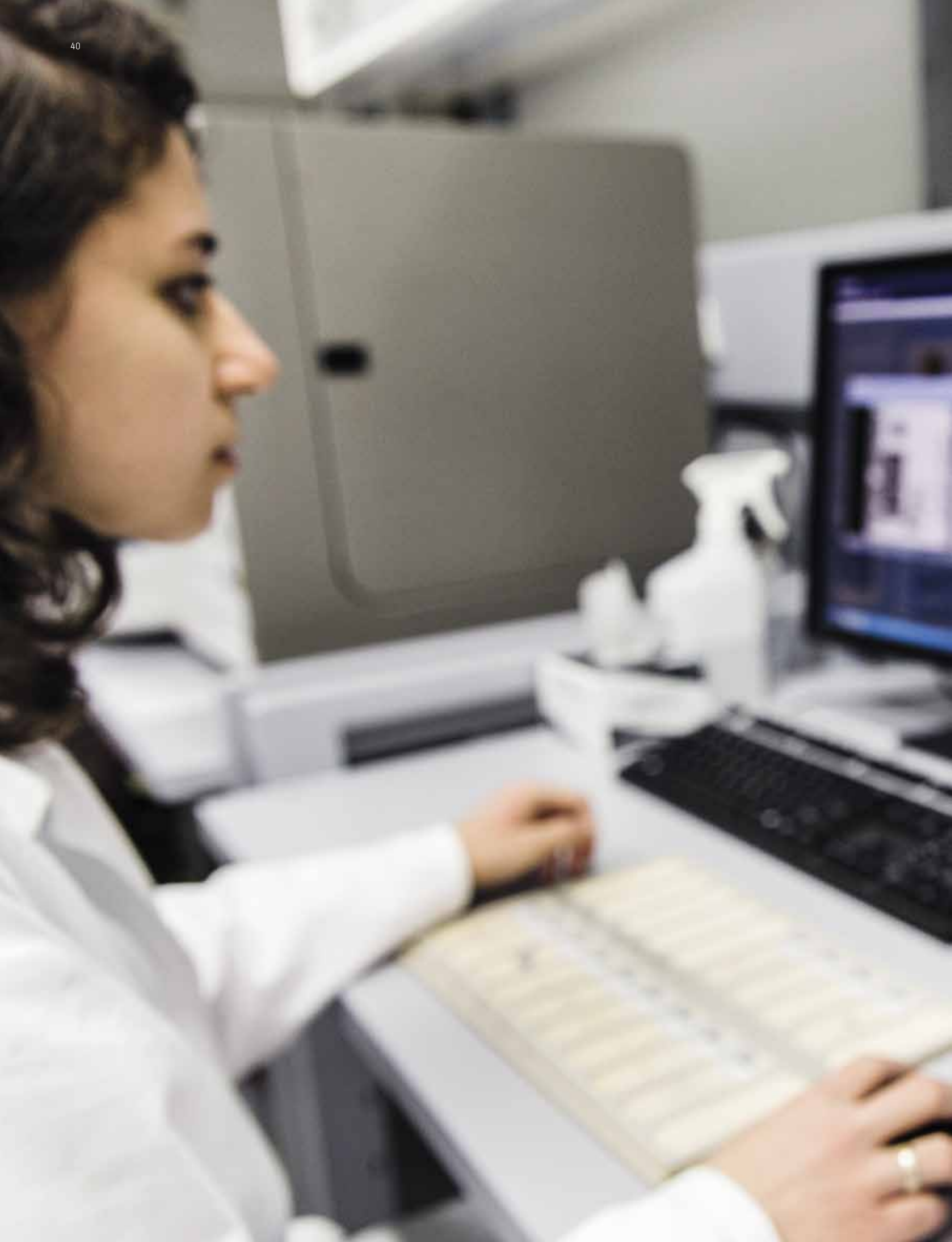
Honestly, as a little child, I was not even aware of how much haemophilia affected my family and me. My diagnosis came about because I had twisted an ankle and the bleeding inside made it turn shades of purple and green. As I grew up, I understood that I needed to be careful while carrying out even the most routine day-to-day tasks. It was always a nightmare when I had bleeding episodes. Very often these occurred at inconvenient times and my parents had to search for hospitals and doctors who were not fearful of injecting something they were not familiar with.

Being at school was difficult at times and I had varied experiences, but they only toughened me. I remember I once broke a leg and twisted an ankle at the same time, and I had to skip the morning lines and recesses for a whole month. Other children would look at me strangely as they thought I was being given special privileges.

I then went on to get a degree in pharmacy and biotechnology. Five years ago, I joined Roche and worked in different areas such as rheumatoid arthritis, anaemia and transplantation. Three years ago, by complete chance, I read an article about Roche developing a medicine called emicizumab (Hemlibra) for haemophilia. That was my company! I hoped that I could work on this medicine one day. Finally, when the position of Product Manager opened up, I applied.

I now work in the launch team of emicizumab in Roche Egypt. We hope that this medicine will be available to patients soon. We are busy in the team with several pre-launch activities, such as education programmes for healthcare professionals, spreading awareness about haemophilia, and talking to physicians and patient groups about emicizumab.

My own life makes it easier to explain the burden of the disease and the challenges the patients face in their daily lives. So during our field visits with the Medical Science Liaisons, a conversation with a medical expert moves to a different level when they come to know that I have the disease myself. Haemophilia is my partner for life. We have got to know each other well. I now hope to use this for the benefit of others.



The core of our business is

science and innovation

Advances in digital technologies and data-driven analytics will increasingly shape research and development going forward, taking personalised healthcare to the next level.

3 GOOD HEALTH
AND WELL-BEING



17 PARTNERSHIPS
FOR THE GOALS



An employee is preparing a sample for Roche's digital pathology platform which is a key asset for programmes such as cancer immunotherapy.



Data insights for better informed **decisions**

Machine learning tools can identify patterns of morphological changes in bacteria that are tightly linked to an antibiotic's mode of action (MOA), each providing a unique fingerprint.

New technologies and advanced analytical tools are helping to manage, mine and make sense of large and fast-growing datasets. They are emerging as powerful catalysts in the transformation of healthcare, both in terms of accelerating research and development (R&D) and ensuring access to the best possible care for patients.

A few concrete examples of tremendous progress made in recent years are wearable devices and smartphone apps for continuous patient monitoring; access to affordable whole-genome sequencing technology; and machine learning capabilities revealing the 'hidden secrets' in medical images. These new tools and technologies will increasingly unlock value for physicians who are intent on identifying the best possible therapy options for their patients, and for regulators requesting solid outcome-based data from real-world settings.

Roche has been building on its wide-ranging expertise and combined strengths in Pharmaceuticals and Diagnostics for the past 20 years. This has made the company a universally acknowledged pioneer and leader in this first wave of personalised healthcare (PHC). As part of these efforts, the company has developed targeted treatments, starting with the breast cancer medicine Herceptin in 1998.

Going forward, our ability to capture and understand unprecedented amounts of data from multiple sources will allow for a higher resolution and a more in-depth view of each patient, thus putting the promise of truly personalised healthcare within reach.

Drawing on our unique combination of strengths—our pharma and diagnostic capabilities under one roof, our leading portfolio of therapies, our wealth

Material topics covered in this chapter

Product portfolio strategy

R&D pipeline strategy and personalised healthcare

of expertise in medicine and biology, our world-leading companies (Foundation Medicine and Flatiron), our global reach and our culture of successful partnerships—we are deeply committed to delivering meaningful and sustainable value for patients and healthcare systems going forward.

Powered by the new possibilities of advanced analytics, we are able to create a wealth of new data insights and opportunities across the entire product lifecycle and R&D value chain. From making more informed choices on which biological targets to pursue in research to innovating and optimising the design of clinical trials and, ultimately, improving patient access to the right drug at the right time, Roche is already using and leveraging these powerful new tools. We are on the cusp of the next wave of PHC, the ultimate goal of which is to equip physicians with tailor-made solutions for their patients.

Optimising drug design: a close-up view of viral heterogeneity and bacterial behaviour

Historically, Roche has been both a pioneer and a powerful presence in the infectious disease area. Prominent examples of Roche products in this space are the antivirals Invisia (HIV), Pegasys (hepatitis C), Tamiflu and Xofluza (influenza), and the antibacterials Bactrim and Rocephin (pneumonia, urinary tract infections, etc).

Roche is currently developing a broad portfolio of innovative and potentially transformative medicines, including direct-acting antivirals and immunomodulators to treat infection with the hepatitis B virus (HBV) and new antibacterials against *Staphylococcus aureus* and multidrug-resistant Gram-negative bacteria.

Viral diversity and susceptibility to drugs

HBV infections are very common around the world. Nearly 240 million people are chronically infected, 80 million of whom live in China alone. As a direct result of their infection with HBV, a sizeable number of these individuals will go on to develop hepatocellular carcinoma, one of the deadliest forms of cancer.

While vaccination is highly efficacious in preventing infection, vaccine coverage is incomplete and ongoing mother-to-child transmission contributes to the continued propagation of disease. And although current HBV treatments effectively suppress viral replication, they are typically not curative. There is therefore a high unmet medical need for curative HBV therapies.

Research has shown that HBV has a higher mutation rate than previously thought. In a surprisingly short period of time, the virus effectively sequesters the human cell's replication machinery in order to proliferate billions of viruses per day with every possible mutation represented.

With modern, state-of-the-art ultra-deep sequencing, these mutant viral strains ('quasispecies') can be characterised precisely. For this purpose, Roche collaborated with two medical centres in the Netherlands and China to obtain representative viral samples from different populations and parts of the world. The 353 samples revealed more than 5,500 variants of a viral surface antigen.

By applying random forest modelling, a well-known machine learning tool, to this data, it is possible to interlink the deep genomic sequencing data with

information on viral behaviour and patient clinical features. The characterisation of HBV genomes can be used to predict which viral genetic features are clinically relevant in people with chronic HBV infection, guiding drug development efforts and individual treatment approaches.

Machine learning in antibiotic research

A growing public health threat making frequent headlines in the media is antimicrobial resistance (AMR). This refers to the fact that antibiotics are increasingly losing their effectiveness against a broad range of common and more difficult-to-treat bacterial infections, as microorganisms acquire resistance to antibacterial drugs. The problem is widespread and especially troublesome with the Gram-negative bacteria and is projected to cause more than 10 million deaths annually by 2050.¹

In view of the pressing medical need for new antibiotics with novel modes of action, Roche re-entered this space in 2013, with a focus on Gram-negative bacteria like *Acinetobacter baumannii* and *Pseudomonas aeruginosa*, and has a number of compounds in pre-clinical development.

To prioritise compounds with the best potential for development as new antibiotics, it is crucial to understand the precise mode of action (MOA) by which the compounds inhibit bacterial growth. Roche is therefore applying innovative machine learning techniques to large image-based datasets to help inform drug discovery and development. This project has required intense in-house multidisciplinary collaboration between experts in the areas of antibiotic research, microscopy-based cellular assays, gene expression profiling and informatics with a focus on statistics, machine learning tools as well as image analysis.

In this project, Roche scientists start by applying sublethal concentrations of a number of compounds from different antibiotic classes to cultures of *Escherichia coli*. This induces changes to key bacterial parameters such as membrane integrity, cell shape or DNA intensity, visible with fluorescence microscopy. The exact pattern of changes is tightly linked to the MOA, providing a unique fingerprint.

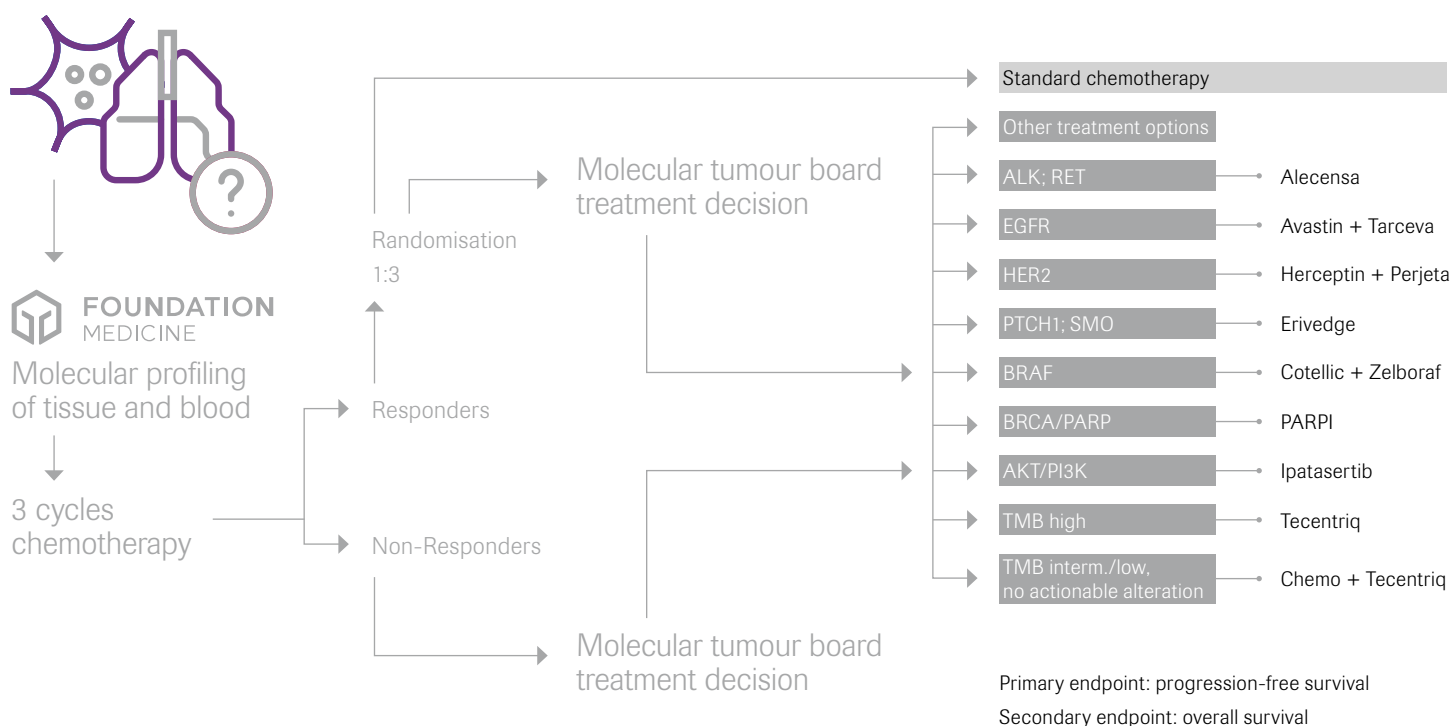
Machine learning is a perfect tool for finding similarities and patterns in large datasets. Meaningful conclusions about similarity in morphological changes can rarely be drawn merely looking at images acquired through a microscope. However, by first applying the appropriate image analysis tool and quantifying changes to more than a hundred different morphological parameters, machine learning can determine if the profile of the changes is unique or matches a known antibiotic. With this novel information in hand, Roche scientists have uncovered unique signatures of prioritised bacterial pathways that are guiding our drug discovery efforts. Thus, through identification of MOA, machine learning can provide important information to support more targeted antimicrobial drug development efforts, the aim being to develop antibiotics that are active in disease-causing multiresistant infections.

Genomic profiles and digital biomarkers: innovating clinical trials for the benefit of patients

The amount of healthcare data generated around the world is growing at an exponential rate, and the sheer volume of medical information is doubling every few months. Take for example, the detailed investigation of cancer at the molecular level with the help of comprehensive genomic profiling or the continuous monitoring of disease progression in neurodegenerative conditions with the help of smartphone-based sensors. They produce billions of data points.

¹ Antimicrobial resistance: tackling a crisis for the health and wealth of nations. London: Wellcome Trust; 2014

The Cupisco trial study design



The Cupisco study will compare the efficacy and safety of targeted therapy or cancer immunotherapy guided by genomic profiling versus chemotherapy in patients with cancer of unknown primary site.

These tools and technologies not only generate vast amounts of data from which valuable nuggets of information can be extracted, they are also offering deeper insights into the nature of diverse diseases. They are, therefore, providing exciting new opportunities for drug discovery and development.

Coming to terms with cancer of unknown primary

Over the last two decades, there has been tremendous progress in comprehending and treating cancer. Understanding cancer biology at the molecular level has led to the development of targeted, more effective therapies. More recently, cancer immunotherapies based on an improved knowledge of tumour immunology have shown impressive clinical results. On the other hand, cancer of unknown primary site (CUP) is still a devastating diagnosis, with no approved treatments available. About 3–5% of all cancer diagnoses fall into this category. It means that although tumour metastases can be detected, it is not possible to find the originating tumour. The

median overall survival in CUP patients is abysmally low—in the range of just one year—so there is an urgent medical need for better therapies.

More granular information on the question of which mutations are driving CUPs is urgently needed as these cancers are not caused by just one mutation, but by a host of different genetic factors. This requires comprehensive genomic profiling, which is where Cupisco comes into play.

Cupisco is a phase II randomised clinical study that will recruit histologically confirmed CUP patients from 20 countries, eventually totalling about 800 participants. A number of approved Roche cancer medicines will be studied in the trial. The study will compare efficacy and safety of targeted therapy or cancer immunotherapy versus chemotherapy, its primary endpoint being progression-free survival. It is a groundbreaking study that represents a shift away from treating cancer based on its organ of origin to



Roche is conducting a research programme created for people with MS to better understand their individual disease course.

treating it based on its clinically relevant genomic alterations driving cancer growth. To this end, Roche is collaborating with Foundation Medicine, a world-leading molecular insights company, matching each patient's unique genomic profile to known therapies or clinical trials.

In addition to performing a thorough molecular work-up for each and every patient, virtual molecular tumour boards, bringing together oncologists, radiologists, surgeons, pathologists and other health-care professionals, have been set up in the Cupisco study to discuss the results of a patient's individual

Foundation Medicine genomic profiling report along with the clinical findings and convert them into a very specific treatment decision. This is unprecedented in a clinical trial setting and has the potential to pave the way for a truly targeted and personalised treatment strategy.

Understanding the individual patient journey in multiple sclerosis

Living with multiple sclerosis (MS) makes for an unpredictable and uncertain existence. Treatments have advanced, but we need to understand more about the disease in order to improve outcomes for patients. Despite advances in imaging, our ability to measure the disease has not changed much for decades and is usually based on visits to the clinic that take place just once or twice a year, providing only a limited snapshot. This means that, although population-level understanding of MS is good, our knowledge of the individual patient journey with MS is not.

Roche has created Floodlight, a research programme to design smartphone-based tests that have the potential to monitor the disease on a daily basis through parameter measures such as coordination and mobility, information processing speed, and mood. This 'neurologist in your pocket' programme also includes Floodlight Open, Roche's first open access study in which anyone can enrol. Each data point from each person contributes to a unique and open dataset designed to help move MS research forward.

Detecting progression of the disease earlier and in a quantifiable manner will be a significant innovation for the MS community. In addition to furthering our understanding of MS and improving individual patient care, there is hope it could accelerate drug development and improve our ability to bring new drugs to the market faster and more efficiently.

Identifying clinically actionable variants

Clinical labs looking to offer next-generation sequencing (NGS) cancer testing are often challenged by the complexities of analysis and reporting. The difficulty they encounter is that of accurately assessing the clinical significance of genomic variants to inform optimal clinical treatment options based on best practices and real-world evidence.

Differentiating benign from pathogenic variants is no small feat in itself, but classifying the degree of actionability for pathogenic variants and underpinning clinical decisions in terms of appropriateness for cancer treatment options, is even more challenging. It requires the review of a multitude of public sources and guidelines to properly interpret the clinical significance and decide the course of action.

In view of this, Roche has developed a clinical decision support solution called Navify Mutation Profiler (NMP), which is planned for launch in early 2019. It will enable diagnostic labs to overcome one of the great challenges of the clinical NGS workflow, namely translating the complex datasets into actionable treatment options.

The NMP is a clinical NGS reporting software solution with a richly curated and up-to-date knowledge base of genetic variants designed to help labs accurately and efficiently interpret the clinical significance of mutations and to identify therapy options and clinical trials that match. It is designed for labs that want to do NGS testing in-house and need a robust clinical reporting solution. Expanding on the already available Navify portfolio of clinical decision support software (eg, Navify Tumor Board), the NMP will simplify the analysis of complex NGS data, aiding labs in identifying and reporting clinically actionable somatic mutations. This sophisticated software will be an integral part of the Navify decision support portfolio, a suite of cloud-based workflow solutions and apps which streamline clinical workflows, integrate patient data from multiple sources and help access relevant knowledge to support treatment decisions.

Partnering for success

The growing complexity of healthcare, coupled with the explosion of data from multiple and often siloed sources, means the future of medicine will be built on partnerships, as no single stakeholder will be able to go it alone or shape it all by themselves. This will require new ways of partnering and collaborating that go beyond traditional boundaries, both internally and externally. Roche is also expanding its collaborative efforts, increasingly combining its own rich resources with the unique tools and technologies of its partners.

Combining in vivo and in vitro diagnostics

In early 2018, Roche and GE Healthcare announced that they were entering a long-term strategic alliance to develop an industry-first digital platform for software solutions marrying *in vivo* and *in vitro* diagnostic insights. This would allow their seamless integration and analysis as part of a comprehensive clinical decision support solution such as the Navify Tumor Board.

This global strategic partnership will offer physicians a comprehensive data dashboard that pulls together information from imaging such as CT or MRI scans, blood tests, tissue samples and gene sequencing, plus the latest clinical trials.

The alliance will help accelerate the delivery of data-driven PHC for care teams, patients and the healthcare industry. It will apply advanced analytics to *in vivo* data from GE Healthcare's medical imaging and monitoring equipment together with *in vitro* data from Roche's biomarker, tissue pathology and sequencing portfolio. The goal is to jointly develop and co-market clinical decision support software for faster and more accurate decision-making by clinicians, enabling earlier diagnosis and individualised treatment for patients.

Collaborating for PHC progress in cancer

In January 2018, Roche entered a collaboration agreement with San Francisco-based Syapse, a key player in healthcare IT. Formed in 2008, Syapse

has created software that integrates otherwise fragmented clinical, molecular (genomic), and real-world data on treatment plans and health outcomes. By combining this platform with Roche's wide-ranging oncology expertise, the collaboration is set to push PHC to a new level for many more cancer patients and healthcare providers.

The Roche Syapse collaboration comprises four key objectives: (1) develop a precision medicine insights product to generate real-world evidence to support accelerated access to innovative therapies as well as Syapse's clinical applications; (2) create evidence for a precision medicine programme to enable health economics and outcomes research; (3) build a patient-reported outcomes programme to understand precision medicine's effect on health-related quality of life; (4) accelerate enrolment in clinical trials by matching eligible patients with trials. The partnership with Syapse will be complementary to our ongoing efforts with Flatiron Health as both companies address distinct healthcare systems and providers through their networks.

Syapse's network comprises about one million cancer patients from nearly 300 hospitals in the US and South Korea and covers 10% of all newly diagnosed cancer patients in the US. This strong network adds to Roche's efforts to bring novel therapies to patients faster, including accelerating regulatory filings.



Harnessing frontline scientific **technologies**

Gene therapy offers hope for patients with choroideraemia, a rare disease of the eye that can lead to complete blindness.

The two Roche research organisations—pRED (Roche Pharma Research and Early Development) and gRED (Genentech Research and Early Development)—are pioneering new ways of tackling challenging disease conditions with high unmet medical need.

Common to all these activities is the relentless effort to first understand the underlying disease biology at the molecular level, and then to identify relevant biomarkers that will help find the right patients for targeted treatment at the right time. The ultimate goal is to develop compounds that zero in on the intended biological target perfectly, have drug-like properties and are well tolerated and highly effective.

Below are a number of highlights from the many innovative R&D programmes in the areas of ophthalmology, oncology and immunology.

Betting on gene therapy in a rare eye disease

Choroideraemia is a rare, monogenic recessive retinal disease caused by mutations of a specific gene, affecting about 1 in 50,000 males. The progressive peripheral vision loss and night blindness, which usually first show up in the patient's teen years, can culminate in complete blindness later in life.

Gene therapy could hold the key to alleviating this condition. In gene therapy, therapeutic genes or specific segments of DNA are introduced into target cells in order to replace missing or faulty genes (in this example the mutant CHM gene) that fail to properly encode for fully functional proteins.

Gene therapy has traditionally faced a real challenge, namely finding effective gene delivery vehicles, or vectors, that fulfil their intended purpose satisfactorily.

However, highly optimised, third-generation adeno-associated virus (AAV) vectors have been perfected into great vehicles for gene transfer that can locate and enter specific cells with a high degree of precision.

The US company 4D Molecular Therapeutics (4DMT) is at the forefront of AAV technology, and choroideraemia may lend itself particularly well to this pioneering modality. By announcing its expanded long-term partnership with 4DMT in April 2018, Roche has entered new terrain with the choroideraemia project as its first foray into gene therapy.

A key advantage of the AAV invented by 4DMT to treat choroideraemia is its mode of application, namely intravitreal injection. Intravitreal application avoids the risk of retinal detachment as it does not involve surgery, which is the case with traditional subretinal application. Furthermore, with this modality, it is possible to reach the whole retina by injecting a functional or working CHM gene into the eye. The AAV has the ability to penetrate from the vitreous space to access the entire retinal target tissue, including the photoreceptors, where the majority of genetic retinal diseases occur.

There are high hopes that this AAV gene therapy could prove of great value to people affected by choroideraemia, and Roche is preparing an investigational new drug (IND) submission to the FDA in order to soon start its first human trial in this space.

Opening new avenues in cancer immunotherapy

Roche is investing more than ever into developing innovative treatment options that help a person's own immune system fight cancer. Building on our approved cancer immunotherapy (CIT), Tecentriq, our development programme takes a comprehensive approach in pursuing the goal of restoring cancer immunity.

With our profound understanding of the underlying science in CIT and extensive experience in engineering new sophisticated modalities, we are in a unique position to drive forward the development of new and potentially first-in-class cancer immunotherapies for the benefit of patients.

Stimulating immunity in a targeted way

Checkpoint inhibitors (CPIs) such as Tecentriq are able to remove a 'brake' in an inhibitory pathway so that the immune system can resume its attack on tumour cells. In contrast to this mode of action, the investigational medicine FAP-IL2v works by stimulating the immune system. FAP-IL2v may either work synergistically with CPIs or show efficacy when patients do not respond or have stopped responding to them.

FAP-IL2v is a home-grown Roche molecule made up of two parts. One part is a high-affinity antibody directed against fibroblast activation protein (FAP), which is found on a wide variety of cancer cells in most solid tumours and some blood cancers. The second part, IL2v, is an engineered form of the IL-2



1 in 50,000

men is affected by choroideraemia. Symptoms usually first show up in a patient's teen years.

cytokine, which is a protein involved in the activation of the immune system. Upon intravenous infusion, the monoclonal antibody portion recognises and binds to FAP, thereby concentrating IL2v in FAP-expressing tumour tissue. The IL2v portion stimulates an immune response and activates natural killer cells and cytotoxic T cells fighting cancer.

Roche scientists engineered IL2v in such a way that it retains the powerful immune-stimulating properties of IL-2 while simultaneously displaying reduced activity on T cells that dampen anti-tumour immune responses. It was also designed to have a longer half-life and a superior risk-benefit profile compared to normal IL-2. Because binding to FAP leads to build-up of FAP-IL2v concentration in tumour tissue, application of this immune modulator will allow for longer activation and higher concentrations in FAP-expressing tumours.

FAP-IL2v is being investigated in four phase I/Ib and phase II studies for a number of cancer types such as renal cell cancer and non-small cell lung cancer, alone and in combination with other therapies (eg, Tecentriq).

Removing a brake and turning on the green light

A novel cancer immunotherapy agent, the monoclonal antibody tiragolumab, was developed at record speed by Genentech scientists, from research to the clinic. It is helping to revive the tumour-fighting ability of

T cells by preventing one of their surface proteins called TIGIT from binding to PVR, a specific receptor on tumour cells.

Within tumours, T cells are impaired in their ability to attack cancer cells due to the expression of inhibitory receptors on their surface; they are 'exhausted'. TIGIT is expressed on the surface of these exhausted T cells, similar to PD1. By hampering TIGIT's interaction with its receptor PVR, the goal is to help remove an additional brake from exhausted T cells, thus reactivating them to 'attack' the tumour. As such, tiragolumab is a novel checkpoint inhibitor, providing added activity on top of Tecentriq, especially in inflamed tumours with high PDL1/TIGIT expression.

Specifically, TIGIT regulates another activating receptor on the surface of T cells, CD226. When TIGIT is expressed on the surface of a T cell, it can limit activation of that cell by disrupting CD226 function. The scientists therefore created an antibody that could block TIGIT from binding to PVR, in this way freeing up CD226 to bind PVR instead and consequently turn on the 'green light'. Therefore, blocking TIGIT not only removes a brake but also allows an activating molecule to signal again. Tiragolumab has a good safety profile as a single agent and also when combined with Tecentriq. Patients are currently being enrolled in a randomised phase II non-small cell lung cancer proof-of-concept study.



Our researchers are pioneering cutting-edge technologies to address challenging diseases with high unmet medical need.

Advancing medicines for people with immune diseases

Recent advances in the understanding of immune pathways guide our research activities for inflammatory and autoimmune diseases. These insights help to yield new targets, new treatments and new ways of thinking —vital capabilities when addressing diseases with high unmet medical need.

Blocking drivers of autoimmune disease

Rheumatoid arthritis (RA) and systemic lupus erythematosus (SLE) both occur when our immune systems begin attacking our own organs and tissues. These conditions are characterised by an increase

in circulating ‘autoantibodies’ produced by B cells and in inflammatory cytokine proteins generated by myeloid cells. In chronic spontaneous urticaria (CSU), a highly debilitating skin disease, autoimmunity is also known to play a role in almost 50% of patients.

In all of these diseases, the current standards of care (anti-tumour necrosis factors in RA, immunosuppressants in SLE, and antihistamines in CSU) fail to achieve sustained remission or to relieve symptoms in the majority of patients. Therefore, there is a significant unmet need for novel therapeutics with improved efficacy and lower toxicity.

Bruton's tyrosine kinase (BTK) is a protein that has been identified as a key activator of B cells and other immune cell types such as myeloid cells. As BTK plays an important role in the development and proliferation of these and other immune cell types, BTK blockade may represent an opportunity for the treatment of a broad range of autoimmune diseases such as RA, SLE and CSU.

Scientists at Genentech faced the daunting task of designing a BTK inhibitor with the right combination of potency, specificity and stability. It took several years of hard work to achieve this feat but finally the researchers found an investigational small molecule that offered a targeted approach to modulating B cells and myeloid cells in the intended manner.

The molecule's name is fenebrutinib, and it is currently in clinical trials. It is a highly potent and selective, orally administered and reversible (non-covalent) inhibitor of BTK. Based on these attributes, it is expected to have an acceptable safety profile. A phase II study in RA recently met its primary endpoint of superior efficacy over placebo; data will be disclosed at a conference in 2019. The lupus and CSU phase II studies are ongoing and expected to be completed in 2019.

Targeting a hormone to halt liver damage

Non-alcoholic steatohepatitis (NASH) is a fibrotic liver disease driven by the accumulation of excess fat in the liver, which triggers an inflammatory and

fibrotic disease process that ultimately leads to cirrhosis and liver failure.

This silent liver disease with few or no symptoms is more likely to develop in people with metabolic disorders such as type 2 diabetes, dyslipidaemia or obesity. As there are currently no approved therapies for this condition, there is an obvious need for an effective treatment.

So what could be done to improve the situation? Fibroblast growth factor 21 (FGF21) is a member of the metabolic FGF family and is expressed primarily in the liver. It regulates fat metabolism and is a potent mobiliser of fat from the liver. Finding a way to target this pathway in a highly specific manner could hold the key to a treatment in this space.

Based on this insight, Genentech scientists created an antibody molecule mimicking FGF21 signalling. The hypothesis was that such a compound could remove the so-called insult of fat accumulation from the NASH liver, halt and reverse the inflammatory and fibrotic process, and restore healthy liver function. Based on a deep understanding of FGF receptor biology, the scientists designed a bispecific antibody to act as an FGF21 hormone mimetic. Since the receptor for this hormone is a combination (heterodimer) of two different proteins, FGFR1c and KLB, a bispecific antibody targeting both seemed ideally suited to generating a long-acting and safe drug with the desired receptor selectivity.

Other anti-FGFR antibodies developed as cancer therapies act by inhibiting the FGFR pathway and thus preventing unwanted cell replication. FGFR1/KLB signalling via FGF21 is not proliferative; it mediates beneficial metabolic signals, and so specifically activates the FGFR1/KLB pathway without activating FGFR1 alone. In addition, it only targets metabolic signalling in tissues that express the heterodimer, such as adipose tissue. The molecule is completing a multiple-dose phase Ib study in obese patients with non-alcoholic fatty liver disease, the precursor to NASH.

With its unique potential to harness FGF21 biology in reducing liver fat deposition, this FGFR1/KLB bispecific antibody also has beneficial effects on other parameters such as insulin, triglycerides and cholesterol, and should therefore be able to provide long-term metabolic health benefits.

First non-immunosuppressive therapy in inflammatory bowel diseases

The cytokine interleukin-22 (IL-22) is an important component of the immune system and plays a key role when a wound or an injury occurs. In fact, IL-22 has a dual mechanism of action in such a setting. First, it helps restore and repair the epithelial cell wall which lines our skin and internal organs such as the colon, and, second, it helps fight off bacteria that can enter through the site of injury, causing an infection. It does the latter by promoting the production of antimicrobial peptides.

Inflammatory bowel diseases (IBD) such as Crohn's disease and ulcerative colitis (UC) are associated

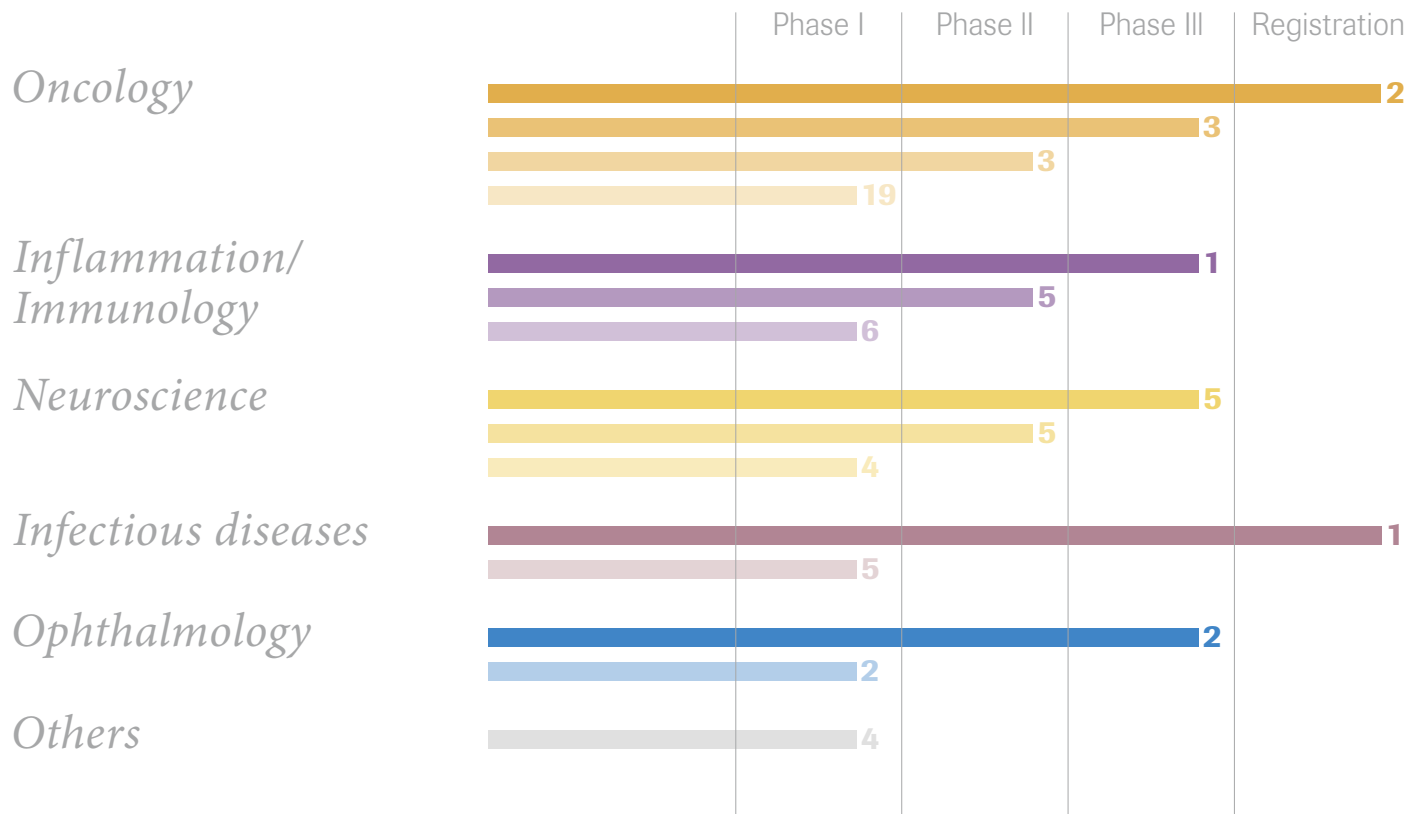
with injuries to the intestinal system or digestive tract, resulting in chronic inflammation and a pattern of mucosal ulcerations on the surface of the intestinal wall. As these injuries elicit a hyper-inflammatory response by the immune system, standard treatments have consisted of immunosuppressive drugs such as anti-TNFs. These drugs combat disease symptoms by blocking immune response, which reduces inflammation.

Genentech scientists have come up with an alternative idea based on the dual functionality of IL-22. Instead of suppressing the immune system in order to alleviate symptoms, the aim is to get to the root cause of IBD by promoting the regenerative and protective functions of IL-22 in epithelial tissue, thereby potentially 'healing' the disease. If this could be achieved, the new medicine would represent a first-in-class, disease-modifying and truly transformative therapy for IBD patients.

In fact, IL-22 has a long history in the company, as both the cytokine and its cell receptor were discovered by Genentech scientists in the early 2000s. After having established the biology behind IL-22, the scientists engineered a new modality, a recombinant fusion protein, IL-22Fc, which links carefully modified parts of IL-22. With its unique dual mechanism of action, this customised fusion protein would be the first non-immunosuppressive therapy in this disease area, designed not to block the IL-22 signal but to apply more of it. A phase II clinical study is just getting started, investigating safety and efficacy of IL-22Fc in IBD.

Pharmaceuticals clinical pipeline

24 breakthrough therapy designations in six years



Our pipeline of 67 new molecular entities covers a broad range of diseases, and highly innovative technologies are applied to create and produce the active molecules.

Importance of intellectual property for innovation

Continued innovation is key to providing new and improved therapies which are crucial for patients as well as for long-term commercial success. Patents and other intellectual property rights provide time-limited exclusivity for innovations, thus enabling substantial investment into research and development. The disclosure of inventions in patents fosters the development of new and improved therapies.



Michael Negrin, Israel

“Here I am three years later, telling you my story.”

According to my doctors, I am not supposed to be talking to you now. They gave me about a year to live after I developed aggressive bladder cancer. But here I am three years later, telling you my story—almost cancer-free and living my life.

I am 67 years old—a husband, father and grandfather now. Three years ago, I noticed blood in my urine and went to the doctor. I was asked to do a series of tests and was diagnosed with bladder cancer. A team of doctors at the hospital decided that I had to undergo surgery and have the bladder removed. But that plan had to be changed. During the operation, the surgeons realised that the cancer had spread and this had not been detected earlier. So they decided not to remove the bladder but instead put me on chemotherapy.

My chemotherapy was five days a week, every alternating week. This was a challenge as I was hooked up to tubes and the process usually lasted about 18 hours each day. The chemotherapy went on for about five months, but there seemed to be no change in my prognosis. I told my doctors that I was very busy and that I was not ready to die. My oncologist then told me that there was another test that she wanted me to undergo. It was a comprehensive genomic test called FoundationOne. She explained that the test might help identify the specific mutation I had. Once this

was identified I could then receive targeted therapy for my specific mutation.

The results were surprising both for my doctor and me. The mutation that had caused my bladder cancer was actually typical in breast cancer patients. I often joke that I became the first bladder cancer patient in Israel to be treated with medicines for breast cancer patients—a combination of two targeted therapies. With this treatment, my condition improved markedly within a few months.

It was because of this test that a very specific diagnosis could be made and I could then be offered a very specific therapy. My doctor explained that there are substantial differences between tumours, even if they are located at the same site in the body. Therefore, I am quite sure that the test can be of great benefit to several other patients. I believe it should be added to different healthcare systems and packages so that the costs are covered. I underwent chemotherapy for months and not only was it damaging, it also did not improve my condition in any way.

These three years have been so important to me. I am leading a normal, active life. I now have a new granddaughter as well. This additional time is so valuable to me and can be to so many others around the world.



Tackling the challenges of
**access to
healthcare**

Our mission is to ensure that Roche, working together with healthcare systems, delivers rapid, broad, sustainable patient access to our novel products.



1 NO
POVERTY



3 GOOD HEALTH
AND WELL-BEING



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



17 PARTNERSHIPS
FOR THE GOALS



People waiting in the hallway of the Kenyatta National Hospital in Nairobi, Kenya—one of the largest medical institutions in East Africa.



Stepping up globally

A hospital pharmacy in Abidjan, Côte d'Ivoire. In this hospital, many of the cancer treatments take place thanks to an agreement Roche has signed with the Côte d'Ivoire Ministry of Health to facilitate improved access to innovative treatments for hepatitis B, C and D and breast cancer.

At Roche, we are passionate about following the science in areas of high unmet medical need to bring transformative medicines and diagnostic tests to patients. But we also realise our products can only benefit patients if they actually reach them. That is why access is an important topic for us.

Almost half the world lacks access to essential health services and 100 million people are still pushed into extreme poverty because of health expenses.¹ We are continuing our efforts to try and change this on a global scale.

In September 2018, Roche launched an integrated Global Access department. In preparation for this, we have been working with internal and external stakeholders to define the Roche access mission, our access strategy, the capabilities required, and appropriate organisations needed to deliver on this.

This new department will develop holistic access strategies so that Roche works with healthcare systems to deliver rapid, broad and sustainable patient access to our innovative medicines and diagnostics. We want to bring our products to as many patients who need them, as fast as possible, and to do it sustainably for both the healthcare systems and for Roche.

We know we cannot do this alone. It is very important for Roche to engage with all stakeholders in the different healthcare systems worldwide. Roche has therefore developed a systematic and comprehensive approach by working with affiliates around the world. Efforts have been made to identify what barriers are preventing patients from benefiting from our products and the steps that need to be taken in order to facilitate better access. Based on this analysis, we develop partnerships for tailored solutions country-by-country. In many situations, it is not just the

Material topics covered in this chapter

Sustainable healthcare

Pricing

Disease awareness and treatment education

Growth strategy in emerging markets

product that we have to think about, but also the complete range of offerings such as patient support programmes, awareness campaigns and disease monitoring.

As part of our efforts, we follow the patient journey from disease awareness to diagnosis, treatment and funding. How can we make sure people are aware of their disease, and educate them? We have to support people in receiving proper and early diagnosis to prevent the disease from worsening. Once patients are diagnosed, adequate healthcare capacity has to be in place in order to deliver the right treatments. Capabilities to run infusion facilities and having sufficient numbers of trained nurses and doctors are difficult to find in some countries. We also have to address how treatments are funded so that patients are protected from excessive financial burden.

We address these access barriers through a strategy that focuses on four imperatives for access—affordability, value recognition, capacity and outcome certainty. In following this strategy, we have already been able to amplify access for patients by 60% in 14 low- and middle-income countries to two of our most important cancer medicines, Herceptin and MabThera/Rituxan, both of which are included in the WHO Model List of Essential Medicines. This represents an increase in population with access of close to 700 million.

Last year, we expanded our focus to also include Perjeta as the new standard of care in combination with Herceptin for women with HER2-positive breast cancer. Our goal is to accelerate patient access and increase the number of patients being treated with Herceptin plus Perjeta in 15 emerging markets by a factor of six from 5,900 (2017) to 35,700 (2022)

—meaning about 800 million more people can benefit from the treatment when diagnosed with the respective disease.

The Access to Medicine Foundation has recognised our strong access-to-medicine strategy in the area of general access to medicine management. Roche is ranked 10 in the 2018 Access to Medicine Index. The Index analyses 20 of the world's largest research-based pharmaceutical companies on how they make their products more accessible in low- and middle-income countries.

Industry collaborations to join forces

Roche plays a leading role in the Access Accelerated initiative launched in 2017. This cross-industry collaboration aims to reduce barriers to prevention, treatment and care for non-communicable diseases (NCDs) in low- and middle-income countries. By the end of 2018, 24 pharmaceutical companies and associations were involved in this programme, in which partners such as the World Bank Group and the Union for International Cancer Control (UICC) participate.

The initiative is a founding member of the UICC's City Cancer Challenge (C/Can2025) to support effective and sustainable cancer care delivery models in selected cities. Four key learning cities kicked off the challenge in 2017: Asunción in Paraguay, Cali in Colombia, Kumasi in Ghana and Yangon in Myanmar. Their participation provides insights into how the international community, local civil society, and the public and private sectors can best work together. In the first four cities, 84 participating institutions, 817 healthcare professionals and 652 patients were connected in 2018 to transform the approach of local cancer care solutions.

1 World Health Organization, The World Bank Group: Tracking Universal Health Coverage, 2017 Global Monitoring Report, 2017.

As part of Roche's commitment to increasing access to sustainable cancer care, it was announced in October 2018 that we would act as the lead industry partner in working with 20 cities by 2020 to develop and pilot a model of engagement for C/Can that could be scaled up globally. We are leading efforts to support cities across the globe and spearhead the design, planning and implementation of state-of-the-art solutions for cancer care. So far, Kigali in Rwanda, Porto Alegre in Brazil and Tbilisi in Georgia have been chosen as cities for the next phase of C/Can.

Using digital platforms to support patients

In the Asia-Pacific region, our ambition is to ensure that more patients have access to Roche's innovative treatments. Patient support programmes (PSPs) are a fundamental component of our access strategies in the region and will help us realise this goal.

To date, there are more than 200 different PSPs in Asia-Pacific serving more than 6,000 patients. These projects have shown Roche that there were a number of hurdles in the region that needed to be resolved. For instance, there is no common approach for PSPs in Asia-Pacific: The programmes are not always linked to long-term access strategies, and there is no platform available to support better management and analysis of the programmes.

| > 6,000

patients in Asia-Pacific are supported by our PSPs.

The Patient 360 platform (P360) was launched to address these challenges. It is a digital solution which puts patients at the centre. It enables affiliates in the region to develop innovative, efficient programmes and improve the experience for patients and healthcare professionals (HCPs) alike.

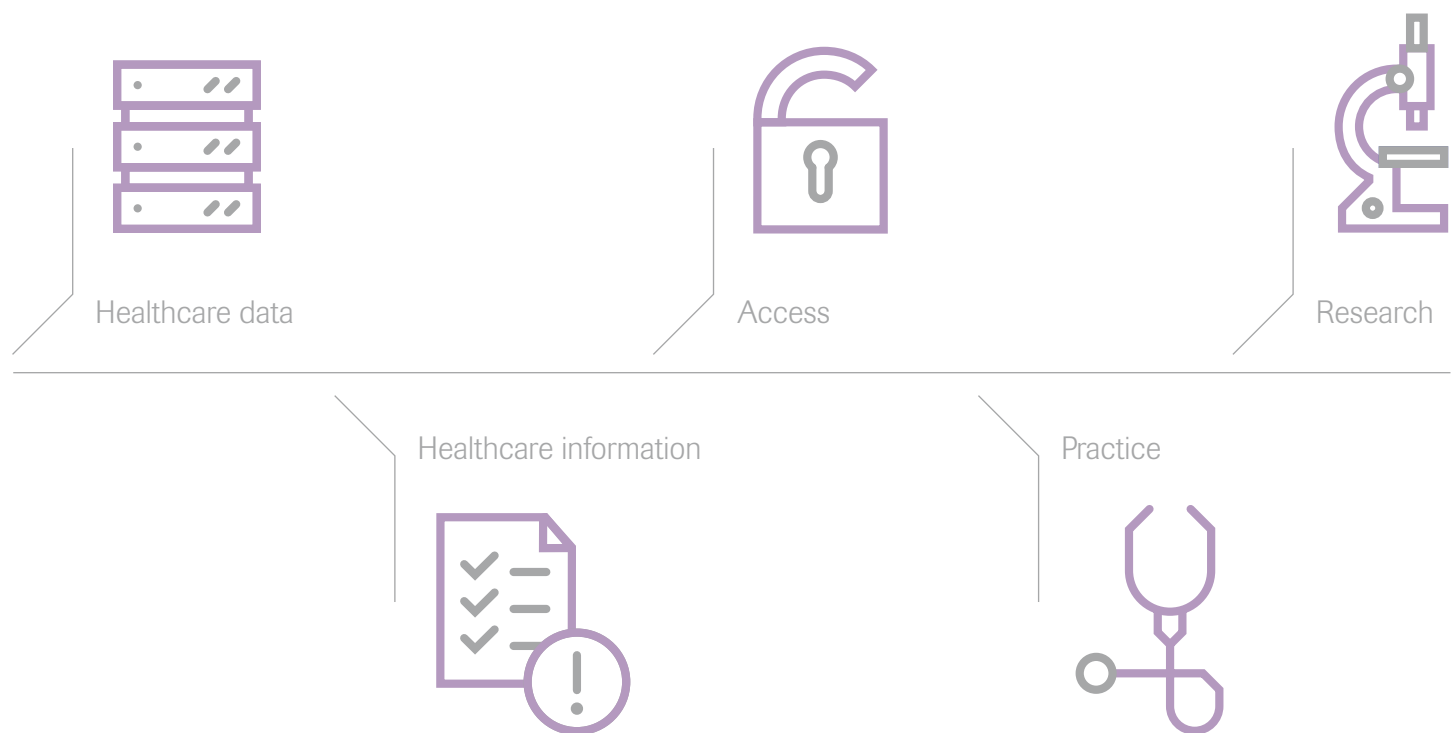
The platform consists of four categories—patient on-boarding, treatment monitoring, scheme management, and adverse event capture—along with a patient and HCP portal. The solution allows patients to take control of their disease management and improve their wellbeing and experience. It will provide a sense of community by connecting them with other patients and HCPs.

P360 will also work towards reducing duplication across the PSP processes, drive better insights and analytics, support the launch processes of products, afford the opportunity to make use of real-world data, and ensure compliance with local laws. In 2018, Malaysia was the first country to launch P360. Thailand and Taiwan followed later in the year. Singapore and Australia are due to follow in 2019.

Making health data accessible

Health data have the potential to help fight diseases, ensure faster patient access to medicines, and drive the future of healthcare—if accessible. Health systems around the world collect different kinds of data (genomic data, real-world data, clinical trial data, etc.) from many sources, yet the infrastructure used to capture these data are often not integrated, leaving data disconnected, incomplete and unstructured.

Data drives healthcare



C-PHIN will leverage quality health data to drive prescribing, access and research decisions across Canada.

Connecting data is important in our mission of delivering personalised healthcare. The Canadian Personalized Healthcare Innovation Network (C-PHIN) initiative, for example, was started in order to build a platform that makes health data findable and accessible. Established in 2017 as a collaboration between Roche Canada, the Canadian Cancer Trials Group, Canada's Genomics Enterprise, the University Health Network, and the University of Waterloo, the initiative is run as a not-for-profit organisation.

The C-PHIN Integrated Data Platform provides a search engine that can access real-time data streams while maintaining patient privacy. With real-time access to data and insights, the platform will foster informed decisions in every facet of healthcare, which will, in turn, accelerate innovation, improve efficiency, lower costs, speed up approval processes, and improve patient care.

Discussions on early collaborations with Health Canada, the department of the Canadian government responsible for national public health, have been positive. Several partnerships have been confirmed with other biopharmaceutical, technology and data management companies. Recruitment of other partners is ongoing.

The platform will be funded by C-PHIN partners and will leverage funding opportunities from the federal and provincial governments. The network is designing a revenue model which will ensure that the C-PHIN Integrated Data Platform will be financially self-sustaining over the long term through access agreements granted to users within the Canadian and international private sector. The public sector, including researchers, hospitals, institutions, payers, governments and clinicians, will be able to access the data from the data platform free of charge.

Continuing the fight against HIV and AIDS

Great progress has been made over the last 40 years in tackling the HIV pandemic. The number of people dying every year from AIDS-related illnesses worldwide has decreased steadily, from a peak of 2.2 million in 2005 to less than a million in 2017.² With early diagnosis, appropriate treatment and monitoring, it is now possible for people living with HIV to have normal, healthy lifespans.

Yet, in areas hit hardest by HIV, such as in the vast region of sub-Saharan Africa, access to healthcare centres that can diagnose, treat and follow up HIV patient care is extremely limited. Worldwide, every fourth person living with HIV still does not know their status.

As the leading provider of HIV viral load testing, Roche created the Global Access Program to expand access to quality, sustainable diagnostic testing while contributing to the UNAIDS 90-90-90 goal. The aim is that by 2020, 90% of all people living with HIV will know their disease status, 90% of all those diagnosed with the HIV infection will receive sustained antiretroviral therapy, and 90% of all those receiving antiretroviral therapy will have viral suppression.

Since the start of the Global Access Program in 2014, access to HIV viral load tests and early infant

diagnosis have improved in 82 countries with the highest disease burden. In collaboration with the Clinton Health Access Initiative and other partners, we provide accessible and affordable pricing for reagents and consumables needed for HIV-1 testing. To train healthcare workers, Roche also offers support programmes that help build healthcare system capacity, including participation in public-private partnerships (PPPs), for instance with the Centers for Disease Control and Prevention in the US. We also invest in developing countries by helping them equip laboratories with the newest technologies.

In August, we formally launched our partnership with the Kenya Medical Research Institute by installing a cobas 8800 for HIV assays. Through the Global Access Program, the partnership aims to ensure that more people in Kenya have access to HIV/AIDS testing and viral load monitoring. Our PPP in Kenya and initiatives like the Roche Scientific Campus in South Africa demonstrate our ongoing commitment to Africa through capacity building and skills development, and go beyond the supply of instruments and sustainable pricing.

In 2018, the number of HIV tests run was more than four times higher than when the programme was launched. The idea is to expand the Global Access Program to other areas and potentially include additional disease areas.

² www.unaids.org/en/resources/fact-sheet



With just a small amount of blood from the person's fingertip needed, the cobas Plasma Separation Card simplifies blood collection and sample transportation even in remote areas.

Redefining the reach of reliable testing

Roche continues to invest in innovative products and solutions to expand access. In 2018, we launched the cobas Plasma Separation Card, a stable and easy-to-use sample collection device for HIV plasma viral load testing. The size of a credit card, it fundamentally changes the way samples are taken and processed for HIV testing.

Traditionally, viral load results required blood samples to be cooled during transport to the lab. With just a small amount of blood from the fingertip, the cobas Plasma Separation Card allows for reliable

quantitative testing of patients with HIV living in remote areas—even in places that experience temperatures of 45 °C and 85% humidity. The sample is protected on its journey to the lab for up to 28 days, even under such extreme conditions.

As the samples can be sent by post, more viral load tests can be carried out. With up-to-date results, care can be personalised and adjusted as soon as necessary. Follow-up monitoring for people who are HIV-positive and who have achieved viral suppression helps them stay healthy.



ANUÁRIO DE PROGRAMAÇÃO

Merula Steagall, ABRASTA and ABRALE, Brazil

“Our focus is on getting a proper understanding of patient needs.”

I have lived with thalassaemia from the age of two, almost 50 years now. Over all these years of living with this severe blood disorder, and working with those who have this disease or others such as cancer, I have realised the value of networks and working with groups to influence decision-makers and bring about change.

In April 2000, I was contacted by a mother of two boys with thalassaemia. I did not know her. She asked me if I could help her find more information about this disorder. What she told me in addition spurred my first interest in the area of patient advocacy—the Brazilian Thalassaemia Society, ABRASTA, was going to curtail its activities because of poor funding and the lack of interest among parents. I offered to be president and take new steps to revive it. I began work with the ministry of health and in two years we were able to transform the treatment situation in Brazil by working with experts who helped in changing treatment outcomes.

In 2002 we formed ABRALE, the Brazilian Society for Blood Cancers, to widen our impact on the political decision-makers and because many physicians we worked with were also treating blood cancers. This was then expanded in 2006 with the formation of Red Alianza Latina, a network of patient organisations across Latin America that would help us in upscaling

the sharing of business best practices among NGOs. Today, we are a group of 120 NGOs in 21 countries.

However, to be really impactful we had to unite private and public efforts and this led to me working with colleagues to set up the movement Together Against Cancer, which brings together about 100 institutions in the private and public spheres to work on a collaborative agenda. The aim is to implement and improve national-level policies for cancer prevention and control. We have had some impact already and were able to set up an observatory to analyse and monitor government microdata on cancer. An online education platform for health professionals and physicians has been established and we have developed several research projects with the patient at the centre. Our focus is on getting a proper understanding of patient needs by listening to the patient more. Our primary objective after that is to improve outcomes and provide better access to adequate treatment.

As patient groups, we need to work with the industry to bring the patient perspective into designing clinical trials early on. This could help shorten the process and focus on the important things. Patients care about quality of life, about survival, and do not want aggressive interventions that they do not understand.



At Roche, we care about
our people

Caring about people at Roche helps ensure that patients will get better diagnoses and therapies.

4 QUALITY
EDUCATION



5 GENDER
EQUALITY



Each year some 100 young people begin their vocational training with Roche in Basel and Kaiseraugst, Switzerland, gathering insights into their future working lives.



People with **purpose**

We work together to design the structures, processes and principles governing how we operate. We encourage employees to share their insights into where improvements are needed.

Throughout its history, Roche has been dedicated to delivering and driving innovation that helps people manage their health through breakthrough medicines and diagnostic solutions. This unwavering commitment stems from a unique and highly adaptable culture which brings together core beliefs in our purpose, people and values. This enables us to proactively evolve in a dramatically shifting landscape.

Today's world is interconnected, digitalised and increasingly complex. This new reality requires ever more innovation, flexibility and speed. It also demands the ability to challenge paradigms so that we can quickly recognise and thoughtfully respond to challenges and opportunities. At Roche, we are transforming the way we work to make sure we can consistently meet the needs of patients and customers, now and in the future.

We are dedicated to ensuring that Roche remains the place where creative, gifted and passionate people desire to work. Our people—the collective source of our innovation—are the most critical factor to our success.

Keeping in touch with each other, and keeping up with changing business needs

At Roche, people understand the power of collaboration, both internally and externally. Working effectively across different geographies and time zones, multiple projects and priorities, and staying aligned are critical for our global business. We have recognised that helping our employees and managers stay connected in this dynamic, fast-paced environment requires a different type of dialogue and cadence. That is why we introduced Check-Ins in 2017 as part of our new People Practices.

Material topics in this chapter

Employee engagement and talent retention
 Compensation/benefits
 Leadership Commitments
 Organisational effectiveness

Check-Ins are conversations between a manager and an employee with a focus on the employee. Ideally happening face-to-face, these conversations can be scheduled or impromptu, and can address a range of important topics, including contributions, personal growth, professional development and more. They can be initiated by either the employee or the manager. While Check-Ins can be used to discuss day-to-day business, the focus is on individual employees, and the discussion is tailored to their needs. Check-Ins have been launched across the organisation to change how employees and managers communicate, and they already form an essential part of how people at Roche work together.

Increasing agility to drive and manage change

The changes in business and political environments require us not only to look at how individuals can work together in different ways, but also at how we can become more agile as an organisation. Roche has defined this agility as an ideal balance between speed, stability and flexibility. Speed enables us to seize opportunities when they arise, from the analysis of real-world data, for example. Flexibility helps us adjust our approaches to suit new situations. And stability provides a clear and important foundation for employees, through our Strategic Framework, Leadership Commitments, Code of Conduct, and commitment to sustainability, as examples.

At Roche, we work together to design the structures, processes and principles governing how we operate. We encourage employees to share their insights into where improvements are needed. Transparency about the challenges and the opportunities is a critical first

step to uncovering ideas and determining the best solutions. Our aim is consistent—developing and testing new, better and faster ways of working that will ultimately help patients.

Our Pharmaceuticals Division provides a good example. Comprising global, regional and local commercial structures, the set-up needed to undergo substantial change to be more efficient, effective and agile. Design sprints were introduced to identify and address the key challenges. Purpose-built teams were assembled from different departments and levels in the organisation, and featured a willingness to embrace ambiguity and challenge the status quo.

Offering a workplace that sees potential in everyone

At Roche, we welcome and value the visible and invisible differences among people, such as age, gender, sexual orientation, culture or thinking styles. We believe diversity and inclusion are essential to generating innovation—a culmination of a wide range of opinions and perspectives to create great and potentially transformative ideas.

In 2018, we launched a Group-level campaign titled “It’s Personal”. The campaign showed, via personal stories submitted by employees, our high level of commitment to supporting a diverse and inclusive work environment with a focus on the individual. It also emphasised our dedication to ensuring that our work environment offers people what they need—both at the office and in different areas of their personal lives. Those needs include different ways of working, flexible schedules, unpaid leave options for those needing to care for a sick relative, and more.

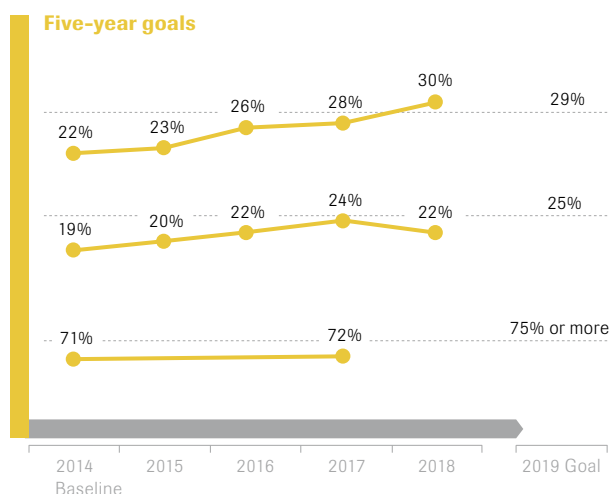
Diversity and Inclusion (D&I) are part of our overall corporate goals. One of our five-year corporate goals is to increase the number of women in key positions by 30%, as well as increasing the number of key position incumbents with experience in both developing and established regions by 30%. We achieved the five-year goal on gender diversity in 2018. On the key position incumbents with diverse experience we made good progress in the first three years. However, in 2018, we saw an actual decrease compared to 2017. This was

mainly caused by a number of structural changes in the organisation impacting various key positions.

The RocheAbility network is an example of how a diverse and inclusive workplace is being shaped by a group of engaged colleagues with the support of a sponsor. The initiative fosters the inclusion of people with disabilities in teams based in Basel and Kaiser-augst, while also supporting employees who are caregivers and partners of family members with

The Global Wellbeing Week 2018 challenged participants to reflect on their own digital behaviour.





30% increase in the representation of women in key leadership roles (2014–2019)

30% increase in the representation of people with established and developing region experience in key leadership roles (2014–2019)

Top quartile ranking in overall employee engagement score, measured by the Global Employee Opinion Survey (2019)

disabilities. This bottom-up effort was rewarded with the prestigious Roche Pharma NEXT award in 2018.

With people living and working longer than ever, multiple generations are now working side by side, offering opportunities to benefit from each other's perspectives. Reverse mentoring has become a widely utilised opportunity to leverage people's strengths and support learning. Participating colleagues have gained valuable insights into a wide range of areas, from the most popular apps that simplify activities to sharing work experiences and connections.

Striking the right balance

Striving to achieve balance is something we all have in common and is yet very personal. Finding and keeping that balance in today's environment can be a challenge. Under our global "Live Well" initiative, Roche promotes a culture of health and wellbeing for all employees. We address the physical and mental needs of our people through on-site exercise facilities, health-screening programmes, medical and counselling services and even legal and financial advice resources. These offerings differ in every affiliate, depending on local needs and opportunities.

The Global Wellbeing Week 2018 focused specifically on digital wellbeing. Through the week, 141 sites introduced interested employees to the latest trends and topics in digital and social wellbeing. The event showcased new tools and challenged participants to reflect on their own digital behaviour, which can have a significant impact on physical and mental health and wellbeing.

Connecting and learning

At Roche, we believe the expertise of people located in various functions and affiliates is often the best basis for decisions as opposed to a top-down approach, and that innovation flourishes when diverse people connect and collaborate, essentially creating networks.

The Purpose-built Networks platform, utilised for cross-functional projects, is a good example of how networks are supported at Roche. The platform provides suggestions on how to start a network-based project, how to set it up in a meaningful way and how to leverage existing expertise in the company productively and across functions. Such project groups are formed around a particular business need and follow the principle of identifying the most suitable team to address that need. Projects running on this principle can serve, for example, as a starting point for faster development of products, or for developing a company view on a particular policy or regulatory topic with experts from different areas.

Workday, the new Human Resources system launched in 2018, offers an additional resource for creating internal networks and enables employees to showcase their professional expertise, experiences and aspirations to the Roche community. The availability of such information empowers recruiters, project teams and individuals in search of specific expertise to find the right individual, quickly and easily. At the end of 2018, only eight months after launch, 43% of employees have started to fill out their individual professional profiles in Workday to make themselves more visible for interesting opportunities.

Working at Roche offers a variety of opportunities to grow and develop. The most impactful development activities typically go beyond traditional classroom training and are not necessarily directly linked to taking on a new role. Many regions and functions offer a Changing Perspectives programme, which enables employees to experience a different area or role for a period of three to six months. During the programme, employees have the opportunity to work on projects, develop leadership skills and gain insights into a new career path that might be suitable for them in the future. This and other programmes help people think more about their career development and decide if they want to take on a technical role, such as that of a scientist or software engineer, or perhaps become a people manager or senior leader.

At Roche, we believe that everybody has the potential to grow and learn. People at all levels are encouraged to learn from both accomplishments and challenges, every day. Insights from these learnings can help boost the entire organisation's ability to move forward. At the same time, these learnings can provide the opportunity to grow and improve, and to utilise the entire Roche community as a valuable source of information and experience.

The leadership journey

Great leadership is essential to attracting and retaining people with talent and dedication. The Leadership Commitments introduced in 2013 remain an important foundation of our leadership culture.

Because an evolving environment continually presents new challenges and opportunities, expectations placed on leaders have fundamentally changed over the past decade. Today, leaders need to demonstrate new capabilities and embrace a leadership style and mindset that is focused on people. At

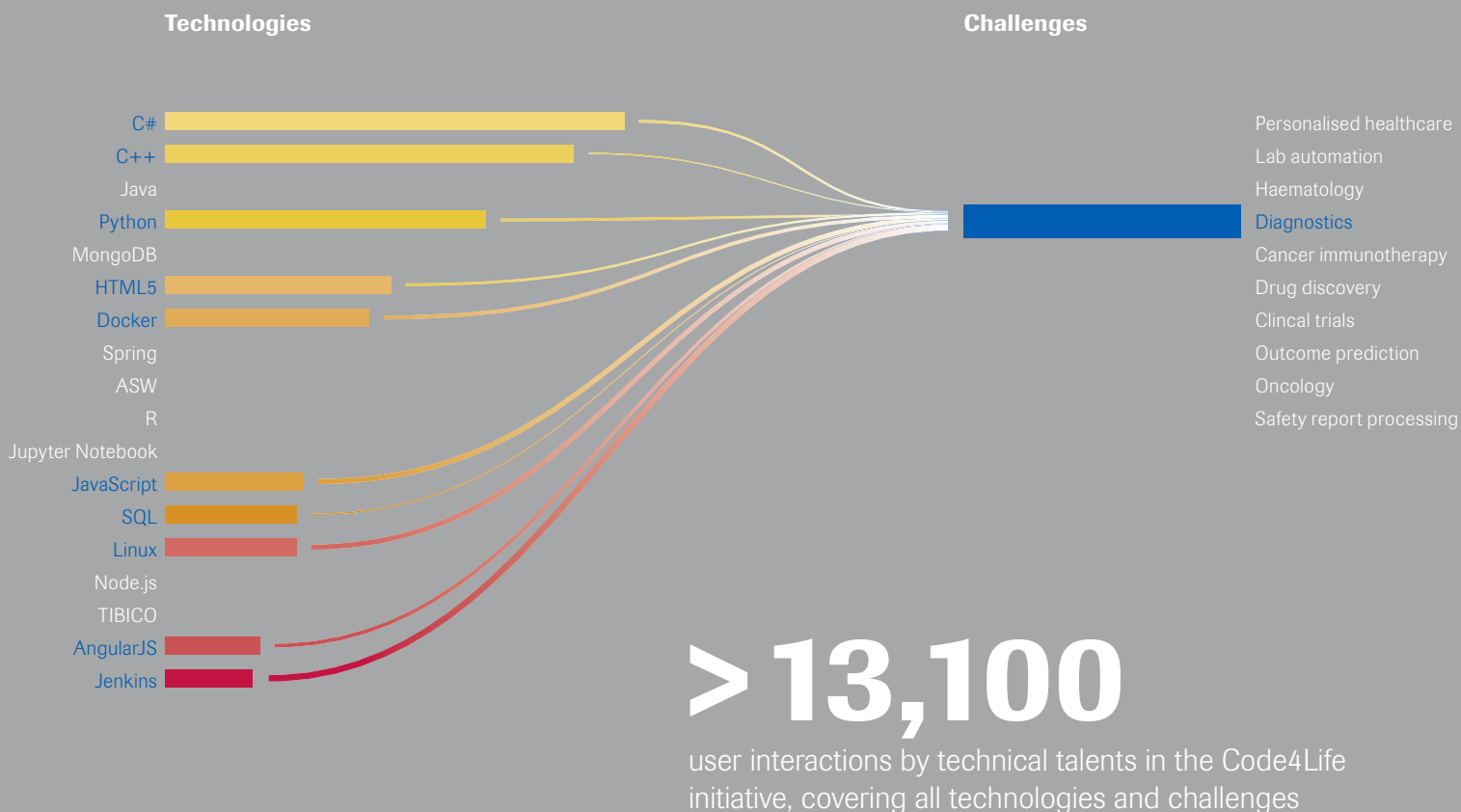
the same time, they must be agile, self-aware and authentic, and must understand the changes in the environment around them. We believe this leadership approach is much more effective at empowering people and helping them to grow, develop and contribute.

In order to accelerate this transformation, senior leaders in the organisation have participated in the Kinesis programme, which was introduced in May 2017. Kinesis aims to help leaders understand how their mindset and behaviours directly impact the effectiveness of their leadership. The programme starts by challenging leaders to confront patterns of thought that, while successful in the past, may now limit their effectiveness. After being introduced to the principles and practices of agile organisations, participants explore organisational transformation, learn about requirements to be a leader, and how to engage others in the transformation journey.

Nurturing and attracting talent

Opportunities for growth and development are as critical to attracting and retaining people as good leadership. With science and technology at the core of our business, providing the right development opportunities for scientific and technical talent is vital. One example is the Scientific and Technical Talent Workstream, which engages with multiple departments and across several functions to focus on this specific theme. Interaction between these functions and their human resources departments fosters an understanding of which people need to grow and thrive, including ways to fully leverage and recognise their scientific contributions.

While digitalisation is already deeply embedded at Roche, our Code4Life initiative is an effort to raise Roche's profile among digital talent who may not



The Code4Life initiative aims to showcase how technology is driving innovation in healthcare. For example, the highlighted technologies help to solve challenges in diagnosis.

yet be aware of the extent to which digitalisation is changing the world of diagnosis and treatment options for patients. Our Code4Life competition was open to university teams and individuals, either external or from Roche. Through this process, participants could learn how significant their impact on healthcare could be, and that digital capabilities can translate directly into benefits for people who need them urgently. In the Code4Life initiative, more than 13,100 interactions with online campaigns have driven over 26,100 visits and 46,000 page views to the website. Recognising that coding capabilities could also exist in unconventional places within the company, we have launched initiatives to identify these digital talents across our organisation and engage them in solving challenging problems.

The progress of digitalisation at Roche is also reflected in the vocational training offered through the apprenticeship system, which is well established

in countries such as Switzerland and Germany. At the Roche sites in Basel and Kaiseraugst, for example, both the teaching methodology and the content meet the highest standards. Apprentices can gain valuable experience in 14 professions, including informatics, biology, chemistry, automation and electronics. Areas that are closely coupled with research and manufacturing, such as programming, 3D printing and robotics, are also part of the programme. To provide insights into the development and manufacturing of medicines, apprentices also participate in exchanges with other sites, such as Mannheim or Penzberg, Germany.

Our talented people across the world collectively believe in our values—*integrity, courage, passion*—and our purpose—*doing now what patients need next*. Together, they are making a meaningful difference each day, and helping to ensure that Roche continues to innovate for the benefit of patients.

Code4Life:
code4life.roche.com



Jutta Steinseifer, Roche, Switzerland

“We need to better understand what patients consider a benefit.”

Two years ago, I went from being a doctor to a patient. After a routine mammography screening offered to all women over 50 in Germany, I received more information about my diagnosis as a gift just prior to Christmas, and with a house full of guests. Since then it has been a journey of looking at breast cancer from the other side. I have been a rebel in my life before, but I had to become one during the course of my treatment, too. Having worked as a Medical Director for Herceptin, our breast cancer medicine that has helped millions of women around the world, filled me with hope but also provided me with scientific arguments when I needed to challenge the status quo.

One thing I have learned on this journey is that all difficult discussions with doctors are much easier if you bring along a second pair of ears attached to a functioning brain. My brain was so often overwhelmed by the information. Two years later I am back at work thanks also to the support of my wife and daughter, and friends within Roche who sometimes helped with real advice, and sometimes by just being there. This has been a huge asset.

A word of advice: do make use of mammography screening if it is made available in your city or town. Always take a family member or friend with you and do not be afraid to ask questions. Get a second opinion when you are not satisfied with the first recommendation.

Having been a patient now myself, I realise that it is very important that we involve patients as partners even more in our drug development. We need to better understand what patients consider a benefit and what is acceptable to them in terms of toxicity of the treatment they are going to receive. It is a whole new mindset and approach. Physicians will always need to be involved because they have the expertise with which to advise patients regarding their treatment options. But we need to develop our products with a focus on patient needs. I learned on my personal cancer journey that doctors do not always know what really matters to patients. We need to involve patients directly and they must have a seat at the table.

In addition to working with external patient groups, we should tap into the knowledge we have within Roche. Many of our colleagues are also patients, or live with patients. For them, our work is about ‘doing now what we need next’. One way of achieving this is through Roche patient networks such as the group that I joined on my return from treatment—PatientsAreUs.

Roche is already on the right track here, making great efforts to put patients at the centre of our work. We can, however, do even better. For example, we in Oncology still have some room for improvement and can make our trials patient-friendlier.



Minimising the impact on the **environment**

At Roche, protecting the environment is not just a legal or social obligation, it is integral to our operations.

6 CLEAN WATER
AND SANITATION



7 AFFORDABLE AND
CLEAN ENERGY



13 CLIMATE
ACTION



Sustainability is a top priority in our construction projects, like here at our site in Kaiseraugst, Switzerland.



Proactively seeking new
technologies

We regularly inspect our pharmaceutical and diagnostics manufacturing facilities for environmental performance and implementation of our environmental policy.

Environmental protection is a central and long-term priority in an ever-changing world. At Roche, protecting the environment is an integral part of our operations and is taken seriously throughout the life cycle of our products. Our Corporate Principles and the Safety, Security, Health and Environmental Protection (SHE) Policy ensure that we commit to the highest standards of environmental protection. In 2018, we invested CHF 181 million in environmental infrastructure and CHF 80.3 million in environmental operating costs, including services and personnel.

Environmental management and compliance

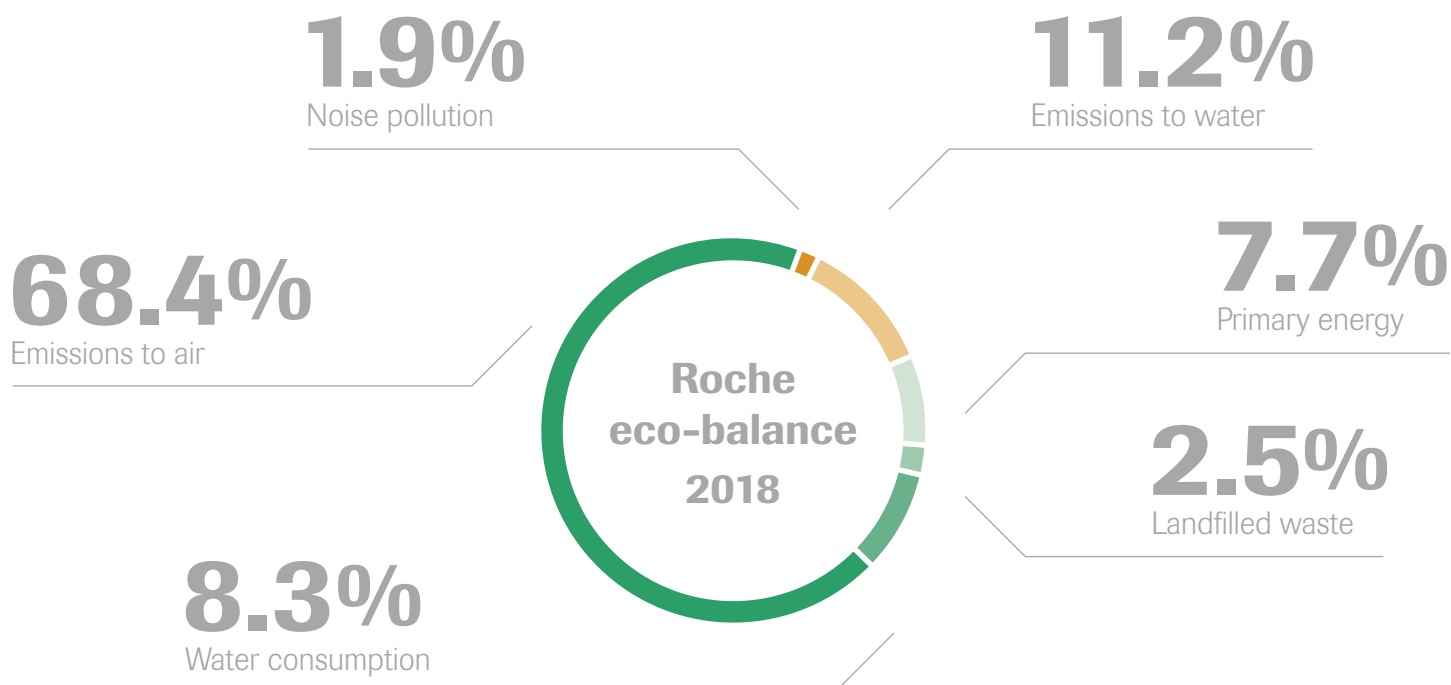
Roche's environmental risks are mitigated via a multi-disciplinary system of prevention and a successful environmental management system (EMS). It is a proactive system which reduces costs, increases efficiencies and enhances competitiveness. A dedicated team of employees around the globe identify potential risks that could possibly cause damage to people,

goods, the environment and Roche's reputation. The Corporate SHE audit team inspects our pharmaceutical and diagnostics manufacturing facilities for environmental performance and implementation of our environmental policy in keeping with legal requirements and internal standards. They also make recommendations on where future improvements can be made. We are committed to continuously monitoring key performance indicators (eg, the five-year goals on page 81), and our aim is to cover at least 95% of each key performance indicator.

We believe that education, awareness and training are the best ways to foster employee engagement in, and responsibility for SHE. With this in mind, we conduct regular training sessions, regional conferences and workshops, and provide online tools in local languages to most employees. In 2018, our employees participated in approximately 259,000 hours of dedicated training.

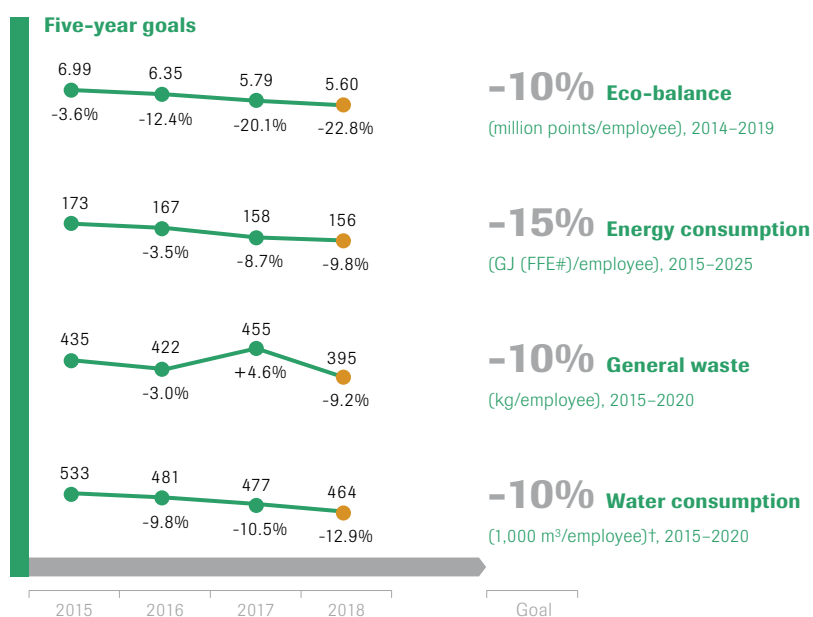
Material topics in this chapter

Environmental responsibility



Minimising our environmental footprint

We measure our total environmental impact using the eco-balance metric, which is a system of points allocated to ecologically relevant parameters.¹ This metric provides us with a global view of how we are impacting the Earth’s ecosystems and allows local site management the freedom to develop locally appropriate strategies and objectives for reducing their environmental impact. The points are added up and then related to the total number of employees, which enables us to monitor our environmental impact per employee. Our strategic goal is to reduce our eco-balance by 10% between 2014 and 2019. We reached this goal in 2016. Since then, we have been aiming to reduce our footprint by a further 2% each year. Improvements in terms of decreasing energy consumption, air emissions, water consumption, and the weight of chemical waste, has led to a further improvement of 3.3% compared to 2017.



FFE: Fossil Fuel Equivalent | † weighted by water stress | Changes in % related to 2014 and 2015 respectively

¹ Developed by the Swiss Federal Office for the Environment, we are compliant with their latest guidelines.

Decreasing energy consumption

Our energy management programme is two-fold. First, we seek to improve energy efficiency throughout our global operations. This, in turn, reduces the environmental impact as well as the strain on the energy supply chain and on costs. Secondly, we endeavour to reduce usage of fossil fuels, cut energy consumption, and increase the proportion of sustainable energy. We have set up energy-saving action plans at our sites. They include the implementation of innovative technologies and continuous upgrading of infrastructure to improve energy efficiency.

In 2018, our total energy consumption decreased by 1.3%, while sales grew 7%. Energy used in buildings and stationary equipment (gas, fuel oil, waste, electricity, district heating) was comparable with that in 2017. Energy used due to business air travel decreased by approximately 4% but still contributes to more than a fifth of Roche's total energy consumption.

Energy consumption in terajoules

	2018	2017	2016	2015
Total (scope 1* and scope 2**)	9,185	9,219	9,824	10,297
Energy (scope 1 and 2) consumption (GJ/employee)#	91	91	98	105
Scope 3				
Business flights	2,754	2,871	2,953	2,876

* Scope 1: energy generated within own facilities (eg, combustion of gas)

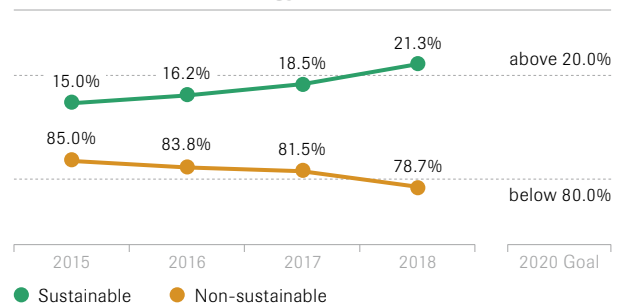
** Scope 2: purchased energy | # Data collected by Group SHE | (GJ = gigajoule)

Our success in reducing energy consumption and carbon dioxide emissions can be credited to initiatives like the renovation of the chimney on the Basel site. This resulted in a significant increase in energy efficiency from approximately 85% to about 95%. This will result in an avoidance of more than 1,500 tonnes CO₂ per year. In monetary terms, it means that Roche will save approximately CHF 850,000 per year in fuel costs.

Reduced emissions due to hybrid cars

Since 2016, Roche Diagnostics in Indianapolis have converted more than 80% of their car fleet to hybrid cars. The new strategy has helped to reduce the amount of energy used by the fleet. The vehicles used approximately 9% less energy in 2018 compared to 2016. In terms of carbon dioxide emissions, moving to hybrid cars reduced emissions by approximately 13%.

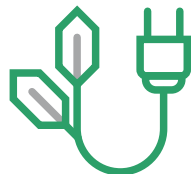
Share of sustainable energy



Energy use by selected types in 2018

31%

Grid electricity...



Our first priority is to reduce usage of energy. For the energy we use we look for ways of improving efficiencies, such as heat recovery. In addition we encourage the use of renewable energy wherever it makes sense.

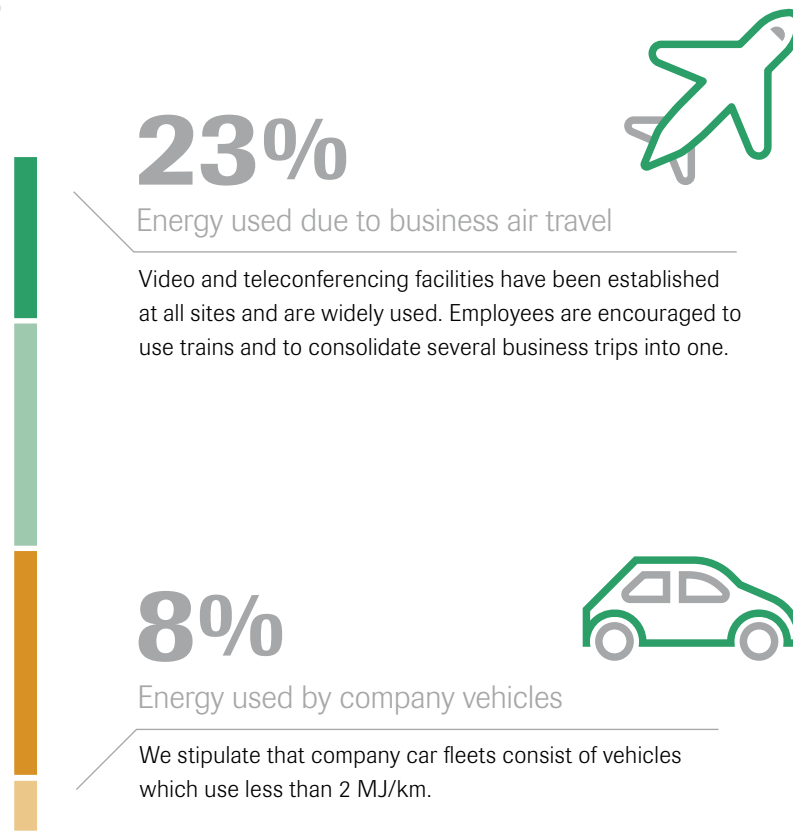
... and natural gas

31%



Sustainable construction at San Francisco campus

Genentech has long been incorporating sustainability principles into the planning and development of its South San Francisco (SSF) campus and has adopted a holistic approach that encompasses green building design as well as employee health and wellbeing. Since 2010, Genentech has reduced greenhouse gas emissions from energy used at its SSF campus by over 30%, thanks in part to its green building programme. Having already achieved LEED Gold certification for its campus community center, Genentech is pursuing WELL building certification, a first-of-its-kind standard that emphasises the health, productivity,



23%

Energy used due to business air travel



Video and teleconferencing facilities have been established at all sites and are widely used. Employees are encouraged to use trains and to consolidate several business trips into one.

8%

Energy used by company vehicles



We stipulate that company car fleets consist of vehicles which use less than 2 MJ/km.

and wellness of building occupants. Genentech has achieved LEED Platinum certification for another new building on campus that was completed in 2018. This building represents several firsts for Genentech, including net zero-energy performance. The annual energy generated through the building's solar photovoltaic system and solar hot water panels is equivalent to the amount of energy used by the building every year. Additionally, a lifecycle assessment completed during project design demonstrated the environmental benefits of the building's wood construction, including a 25% saving in embodied carbon when compared to a steel structure.

Reducing greenhouse gas emissions

Greenhouse gas (GHG) emissions—such as carbon dioxide—resulting from human activities are considered responsible for accelerating global warming and climate change. Industry is one source of these emissions and must take appropriate measures to reduce its impact. International agreements, such as the Paris Agreement, which Roche actively supports, as well as national legislation, define targets and schedules for reducing emissions. We are working towards our own goal—set in 2015—to reduce our scope 1 and 2 GHG emissions per employee by 15% over ten years by 2025.

Our emissions strategy prescribes a continuous improvement at our manufacturing sites, while our aim is to avoid, reduce, and control air pollutants in line with our eco-balance goals. Despite the increased production resulting from our continued growth, our objective is to keep emissions to the air at the low levels achieved in the past few years.

We were able to reduce our scope 1 GHG emissions by 1.9% by implementing energy-saving measures that reduced the amount of fuel we use to heat, cool and operate our sites. GHG emissions originating from the transformation of purchased energy consumed by us (scope 2) were also reduced by 2.3%.

Since 2010, a total of 1,546 projects have been completed, resulting in an avoidance of approximately 208,267 tonnes of CO₂ emissions. This has led to an estimated cost-saving of approximately CHF 47.1 million.

Emissions to the air from Roche sites are at very low levels.

Emissions to air in tonnes

	2018	2017	2016	2015
VOCs*	85	101	124	116
Particulates	20	20	21	26
Nitrogen oxides	201	232	219	228
Sulphur dioxide	5	7	6	11

* Volatile organic compounds

Another initiative to reduce GHG emissions at Roche is to reduce our use of halogenated refrigerants, which are used in cooling equipment and can remain in the atmosphere for a long period of time. We have therefore committed to a 20% reduction in our use of these halogens by 2020 compared to 2015. At Penzberg, Germany, we have been working with local suppliers to develop new technologies using natural refrigerants. To date, we have been able to replace 1,600 kg of halogenated substances thus avoiding 3,400 tons of carbon dioxide equivalents. The approach of applying environmentally friendly refrigeration was honoured by the regional government in 2018.

Halogenated hydrocarbons in tonnes*

	2018	2017	2016	2015
Inventory	91.3	114.3	134.3	154.6
Consumed released	2.2	1.3	2.7	1.8

* Global inventory including Chugai, Genentech and Ventana

Emissions:
[roche.com/
 environment/
 emissions_to_air_
 and_to_water](https://roche.com/environment/emissions_to_air_and_to_water)

208,267 tonnes

of CO₂ emissions have been avoided since 2010.



In the long term, our goal is to fully substitute fossil and nuclear energies with energy from renewable sources. At our Diagnostics site in Suzhou, China, we installed photovoltaic panels to cover almost 80% of the energy needs of the administration building.

CO₂-equivalent emissions in tonnes

	2018	2017	2016	2015
Scope 1				
Fuel combustion	284,890	291,850	319,538	379,457
Halogenated hydrocarbons	4,746	3,469	6,463	4,964
Scope 2				
Market-based	263,973	270,123	320,860	322,046*
Location-based	334,155	343,711	403,924	408,078*
Total (Scope 1 and Market-based)	553,609	565,442	646,861	706,467*
Scope 3				
Business flights	195,530	203,814	209,660	204,179
Energy-intensive utilities**	9,735	9,081	15,170	20,064
Waste	52,712	66,522	63,560	-

* Due to changes in reporting methodology, this number is different to that reported in 2015. | ** Compressed air and liquid nitrogen

Reducing water consumption and waste

Currently, Roche has no high-usage operations in areas of water scarcity and no water-related risks. Nevertheless, we adapt conservation and reduction programmes according to local conditions and needs. Our Californian sites, for example, use drought-resistant landscaping. At other sites, we collect and recycle water from our cooling towers, creating a closed-loop system that reduces water use. Reducing total water consumption is an important part of our overall environmental target, and the water goal reflects this.

Water usage and discharge

	2018	2017	2016	2015
Water withdrawn (million m ³)	16.6	15.9	18.2	18.9
Water consumed (million m ³)	3.4	3.0	3.1	3.5
Water discharged to treatment plant (million m ³)	5.8	5.8	5.7	7.8
Organic matter discharged to waterways after treatment (t)	185	144	149	190
Heavy metals discharged to waterways after treatment (kg)	149	129	164	160

Efficiency meets ecology

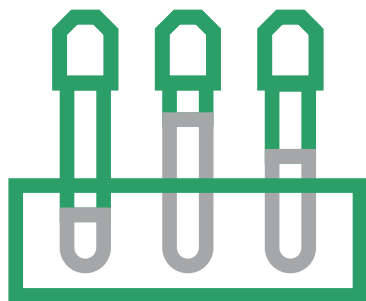
We aim to implement the following waste management strategy in all our waste activities: avoid, reduce, reuse, recycle and thermally destroy. We permit landfilling only as a last resort and, even then, only for inert materials such as slag or ashes. Waste minimisation and reduction measures are not only restricted to production processes but are evaluated and implemented across all operations at Roche. We strive for eco-efficient solutions which show both a reduction in the environmental burden and an economic benefit, eg, reduction in raw material and disposal cost.

Landfilled and incinerated waste in tonnes

	2018	2017	2016	2015
General waste generated	11,183	12,478	12,498	26,314
Chemical waste generated	13,563	17,245	21,906	25,742
Contaminated soil	77,681	108,766	54,937	—*
Construction waste	8,443	16,189	12,804	8,223

* Prior to 2016 this data was not collected separately.

The Roche Innovation Center in Copenhagen in Denmark presses and sells its waste to recycling companies. The monetary compensation is enough to



Up to 136,000

tonnes of CO₂ emissions will be avoided over the next 10 years with our reagent production and transportation.

cover the waste press. By recycling waste, it avoids carbon dioxide emissions linked to incineration procedures. In 2018, 3,950 kg of cardboard and 2,552 kg of paper were pressed and sold to avoid approximately 13,500 kg of carbon dioxide. This initiative therefore benefits both the environment and the company.

When developing a new diagnostic system, reducing the impact on the environment is a crucial element of the process. Our innovative instrument design and vast experience in test development allow us to operate with lower reagent volumes and therefore to produce smaller reagent carriers that generate less waste per test. With the implementation of cobas e pack green and cobas c pack green, we will avoid up to 136,000 tonnes of CO₂ emission over the next ten years in our reagent production and transportation. This represents 45,000 flights between Basel and San Francisco. Our ecological mindset helps customers to address some of their key challenges in lab testing sustainability. These efforts reflect our commitment to Product Stewardship. At Roche, we aim to minimise the safety, security, health and environmental impacts of our products and devices. Our efforts also help

address customer demands for greener products and supply chains, and public concerns about chemicals and pharmaceuticals in the environment.

Pharmaceuticals in the environment

Traces of pharmaceutical products can enter the environment in a variety of ways, including via the manufacturing process, improper disposal of unused medicines, and through natural metabolic processes following normal patient use. Roche is acting on concerns about the impact of pharmaceuticals on the environment by considering the entire life cycle of its products. MabThera/Rituxan, Herceptin, Avastin, Perjeta and Lucentis are monoclonal antibodies which generated CHF 25.0 billion in sales in 2018. They belong to a defined class of active pharmaceutical ingredients (APIs) exempt from the European Medicines Evaluation Agency guideline on environmental risk assessment. They have a low excretion rate and are deemed to present no significant risk to sewage works and surface waters. They are therefore termed 'benign in nature' and constitute environmentally sustainable compounds. All of our pharmaceutical products are, however, subject to a rigorous environmental risk assessment.

Product
Stewardship:
[roche.com/
environment/
product_
stewardship](https://roche.com/environment/product_stewardship)



Striving for long-term

community engagement

Working together to bring in change for the better can take a variety of forms. We mobilise resources and serve as catalysts to strengthen and sustain local communities.

1 NO
POVERTY



2 ZERO
HUNGER



3 GOOD HEALTH
AND WELL-BEING



4 QUALITY
EDUCATION



5 GENDER
EQUALITY



6 CLEAN WATER
AND SANITATION



9 INDUSTRY, INNOVATION
AND INFRASTRUCTURE



11 SUSTAINABLE CITIES
AND COMMUNITIES



15 LIFE
ON LAND



Funds raised at our annual Roche Children's Walk go to initiatives supporting education, health or social development around the world. In 2018, nine Roche ambassadors had the chance to visit Selam children's villages in Ethiopia and to experience first-hand the progress made when resources are put to good use.



Paths to strong **societies**

A mother living at the Roche Children's Centre in Mumbai learns embroidery. Skill-based workshops are conducted at the Centre to help parents acquire new skills to generate increased income for their families.

Strengthening the communities in which we operate is part of Roche's responsibility as a global citizen. Our philanthropic engagement is directed toward supporting humanitarian and social projects, fostering science and education, art and culture, as well as providing long-term disaster relief. We support projects run by international NGOs from our headquarters as well as local projects managed by our affiliates in collaboration with local NGOs, because they know the needs in these countries best.

Making a meaningful difference takes time, and this happens through partnerships that are given time and the opportunity to evolve. Our approach has once again been honoured by achieving an excellent score on Corporate Citizenship and Philanthropy in the Dow Jones Sustainability Indices. While recognition is important, it is crucial that these projects thrive and the resources are put to good use.

This is one reason why employees worldwide join forces during the annual Roche Children's Walk and raise money for local projects. In 2018, 23,228 employees in 74 countries participated in this effort. With the matching contribution made by Roche, more than CHF 1 million was collected this year to support children's projects.

Providing holistic care for children with cancer

One such project funded by the Children's Walk is the partnership with St Jude India ChildCare Centres, an organisation that provides shelter and care to children undergoing cancer therapy. In countries like India, providing access to medicine often takes more effort than just making medicines available commercially. There is also a need to create an environment in which patients are able to start and complete their treatment.

Material topics in this chapter

Community engagement

Sustainable healthcare

Disease awareness and treatment education

Although therapy for paediatric cancer is subsidised and sometimes even free of charge at the Tata Memorial Hospital in Mumbai, the dropout rate is significant. There is a simple reason for this: Two-thirds of the patients come from outside Mumbai and housing in the city is beyond their means. With no roof over their heads, weakened by disease and the effects of chemotherapy, these children are prone to infection and find it difficult to fight their cancer.

In 2016, Roche opened a centre on the Mumbai campus of St Jude India. It offers a clean and safe place to stay for 12 children with cancer, at any given time, and their families. Here they can feel at home for the duration of their treatment, get nutritional support, education and counselling. Apart from Roche's financial contribution, employees volunteer their time and passion to arrange recreational activities like performing dance and storytelling sessions.

The partnership has helped decrease the overall dropout rate for treatment of paediatric cancer in Mumbai from 30% to 5% since 2016. All 111 children who have found a temporary home away from home in the Roche centre completed their treatment. Watching the project flourish, we expanded the partnership with St Jude India by opening a second centre in the eastern region of Assam in 2018. Roche also established a mobile training van that

travels across the state of Maharashtra to teach basic occupational skills to parents at St Jude India centres in the state.

Connecting to local healthcare systems

While the partnership with St Jude India is well on its way, another Roche alliance has made history already. Beginning its journey 24 years ago, the healthcare train Phelopepa is one of the most successful humanitarian projects in South Africa. With the Roche Health Clinic and Pharmacy Clinic on board, it delivers primary healthcare and health education to impoverished communities in remote areas. The Phelopepa trains run 36 weeks a year and travel to up to 70 remote communities annually. The inception of the first Phelopepa train took place 24 years ago. Today two trains are running and have provided treatment to over six million patients and dispensed over 700,000 prescriptions.

Since 2016, the overall dropout rate for treatment of paediatric cancer in Mumbai has decreased from

30% to 5%

Unlocking potentials and growing talents

Education can break the vicious cycle of poverty by teaching children skills and knowledge that are needed to develop and improve their lives. Therefore, Roche's philanthropic engagement is often accompanied by an educational component.

We carefully choose our local partners to ensure they share values such as integrity, fairness, accountability and transparency. In 2018, nine employees from among the top Children's Walk fundraisers had the opportunity to visit one of these partners—the Selam children's villages in Ethiopia. Here, they witnessed the progress being made with the funds.

Around the world ...

Selam is a non-profit organisation that provides housing and holistic care to orphan children in Ethiopia so that they can develop and become self-reliant. Selam's quality schools are run for all ages, and their technical and vocational training centres also benefit disadvantaged children and youths from surrounding communities.

Roche supports a total of 110 children, 60 of whom live in five orphan homes run by house mothers in Addis Ababa City, Yeka Sub City, Kotebe, Wereda and Bole Sub City. Fifty youths are on vocational training in Selam's schools and training centres. Our objective is to allow these students to focus entirely on their education by removing financial pressure that could otherwise hinder their progress. All the students who completed this training so far have been able to find a job very quickly. Additional funding helps

the foundation with renovation work and better employment conditions for local workers.

In addition, we are promoting a School Readiness Programme launched by UNICEF in Ethiopia. Among the initiatives being supported by Roche, all of which are recognised by the Ethiopian Ministry of Education, is a Child-to-Child project to improve school readiness through peer tutoring by older children. With the help of Roche, 9,040 children accessed early learning opportunities through this initiative in 2018.

... and around the corner

We also foster education closer to home, with numerous projects designed to promote an interest in science and technology among young people. Since 2009, Roche has been a founding sponsor of the International Swiss Talent Forum, a think tank for young adults from all over the world to address global and long-term challenges of our time. By connecting students with experts, decision-makers and lateral thinkers, the International Swiss Talent Forum creates a space for innovation, interaction and debate to develop new solutions for globally significant issues. In 2018, 70 young adults, aged 18 to 22 years, from 22 countries all over the world came together to find novel answers to challenges to be faced in "The Future of Urban Life": How can cities handle fast-growing populations? How can cities become more self-sufficient? Next year, other students will have a chance to reflect on "Artificial Intelligence".



> 1,000

high school students were involved in the four-year coursework at Futurelab in the 2017–2018 school year.

Futurelab is a Genentech initiative developed in cooperation with the South San Francisco Unified School District. It is designed to inspire K-12 students (from kindergarten to 12th grade) for explorations and careers in science, technology, engineering and mathematics (STEM).

Science Garage is the newest part of Futurelab. It offers a four-year biotech pathway designed to give high school students a chance to discover the exciting field of biotechnology. Science Garage starts with a three-week biotech unit for all ninth graders during their compulsory biology course. During the 2018 school year, students ran an experiment in the field of classical genetics and gene identification.

Their appetite for biotechnology was further demonstrated by many students as 25% of them continued on the pathway to take additional elective biotech coursework. Over the course of two years, students will become familiar with a variety of concepts, laboratory techniques and career pathways in the biotech industry. Each year, over 1,000 students from the South San Francisco School District are involved in the four-year programme.

Apart from the 14 teachers delivering the units and courses, more than 100 employee volunteers from

Genentech provide monthly support. Benefits accrue for both sides—66% of volunteers say programmes like Science Garage make them more likely to stay at Genentech and 86% report they developed skills as a result of volunteering.

Sharing skills and experiences

As part of Roche's ongoing commitment to improve education in some developing countries, micro-secondments combine the know-how and skills of Roche employees with local NGOs to build capacity, deliver sustainable outputs and increase impact. Under the umbrella of our collaboration with B360 education partnerships, which facilitates knowledge-sharing between Europe and Africa, three Roche employees served as guest lecturers in 2018 at the Namibia University of Science and Technology (NUST) in Windhoek, a Roche partner university. Two of them ran a programme in environmental health science, supporting and coaching 14 students with hands-on exercises. The other taught logistics and supply chain management to over 350 students. Those assignments were conducted in close collaboration with the university, integrating real business cases into their curriculum, encouraging employability, and supporting durable knowledge transfer.



Continued commitment to

integrity in business

Applying high ethical standards in all our activities is the foundation of our success. Integrity pays, for all our stakeholders and for society at large, but also for the business overall.

16 PEACE, JUSTICE
AND STRONG
INSTITUTIONS



17 PARTNERSHIPS
FOR THE GOALS



We work closely with our suppliers in construction and engineering to ensure sustainability of our business.



A matter of **culture**

We aim to translate formal guidelines into business-integrated compliance. This creates a positive impact on business practice.

The expectations are clear: Patients, healthcare professionals, the authorities and society at large trust that we act ethically and responsibly, not just because we are bound by law or for reputational reasons, but to live up to our own values.

Working with integrity is a professional virtue asked of all employees. Everyone is expected to assess risks for unethical behaviour within his or her area of accountability, prevent or mitigate them, and adopt corrective measures. In Roche, this philosophy serves as the starting point for a culture of integrity that is embedded in everyday business and results in compliant behaviour.

Our approach:
[roche.com/
approach](https://roche.com/approach)

Shedding light on grey areas

As part of our comprehensive compliance management efforts, we facilitate business-integrated and impact-oriented decisions by simplifying processes and adhering to the principle of “trust but verify”. This does not mean that employees are left to themselves, because they can count on a supportive and connected Compliance Officer Network.

As the face of our organisation and as role models for employees, General Managers (GMs) play a central role in fostering ethical behaviour in their respective teams. With this in mind, a compliance induction programme for new GMs has been launched in recent

Material topics covered in this chapter

Compliance

Occupational accidents

Drug efficacy, safety and counterfeiting

Data transparency on clinical trials

Patient organisation support

Supply chain management

years. Tailored to the affiliate's needs, it is used to discuss compliance topics with the help of practical examples. Its overall objective is to make sure that the GM is able to foster a culture in which every employee is accountable for doing the right thing while carrying out her or his responsibilities.

Another example of how we embed compliance into the business is the Compliance Maturity Questionnaire. Originally developed in France, this tool helps the compliance officer and top management to understand the compliance status, identify areas of advancement, and above all, discuss compliance with different business teams in the wider organisation. Compliance business partners from different departments judged themselves with reference to 13 different topics, for example, speak-up culture, communication or management in case of non-compliance. Adapted by other affiliates, the questionnaire now serves as a valuable tool for local compliance management to identify compliance risks and set priorities accordingly.

Pioneering the integration of digital tools

As a way of simplifying access to relevant information on compliance, we continuously enhance the integration of digital tools. For instance, in Latin America, the challenges of a highly heterogeneous region in terms of legislation, country size and market characteristics can only be met by innovative solutions to assist medical decisions and services.

With the help of IT colleagues, a tool was developed to provide an approval workflow and a repository of documents to compliantly manage interactions with healthcare professionals (HCPs). The tool assists the Diagnostics affiliate in Panama in their interactions with HCPs in Central America and Caribbean countries, and this concept is now being evaluated for the other Diagnostics and Diabetes Care affiliates. Also, stemming from a creative idea in the Pharmaceuticals organisation, is a compliance app which is now available to Pharmaceuticals, Diagnostics and Diabetes Care teams throughout Latin America. At the click of a button, sales staff can retrieve information on key compliance criteria and other requirements. The app can also be used as a tool for analysing and planning compliance programmes and campaigns.

Compliance

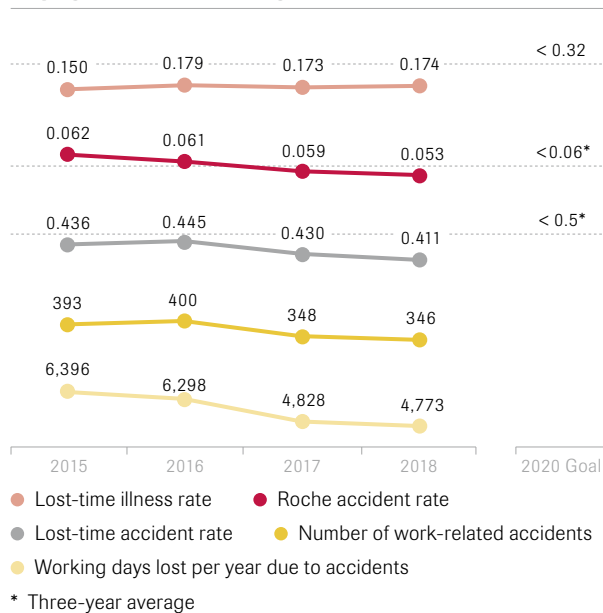
In 2018, 131 employees used the Roche Group SpeakUp Line, which is available in 53 languages in 103 countries. The Chief Compliance Officer received 601 reports relating to alleged violations of the Code of Conduct via the Business Ethics Incident Reporting system. Of these, 246 were unfounded, 245 were founded and 110 are still under investigation. As a result, 19 employment contracts and 94 agreements with business partners were terminated on grounds of unethical behaviour.

Ensuring operational resilience

In keeping with our ongoing efforts in sustainable development, Roche is striving for continuous improvement in the areas of safety, health and security. Over the years, we have implemented a variety of initiatives to improve our already excellent track record in the areas of accidents and health.

As a result, the number of accidents is at a constant low (see graph), with the vast majority being ‘slips and trips’ as in any household. As our accident rate is so low, a single accident, resulting in a longer absence, can lead to fluctuations in the accident rate key figure. We have set feasible but ambitious goals and have established health and safety committees at all Roche production sites and at many other sites according to risk levels.

Employee health and safety



Consequently, we are on track to achieving our mid-term targets for the period 2015 – 2020.

The health and wellbeing of employees, both at Roche and in our business partner organisations, are always top priority. Consequently, our business partners are expected to meet our rigorous standards, too. This policy is now bearing fruit. Since the establishment of the new Diagnostics site in Suzhou, China, in 2015, workers spent seven million working hours with no reportable accidents.

Responsible and prescient handling of chemicals

In June, Roche complied with a mandatory requirement of the European Union’s regulation on Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) by registering all existing substances with a volume of over one tonne per year.

Regarding chemicals, Roche has traditionally gone beyond just the legal requirements. For instance, we have initiated a pilot project with the European Chemicals Agency (ECHA) and partner companies to share archived data with the scientific community. By doing this, we improve the knowledge on the toxicity of chemical substances and thus help to reduce the number of animal studies.

Another initiative involves Substances of Very High Concern (SVHC) that have been listed by the ECHA. We have set ourselves the ambitious goal of voluntarily phasing out these SVHC from our products and processes worldwide within ten years of their appearing on the list, where technically feasible.

Protecting from harm and tampering

Digitalisation has become integral to our approach to security, with digital solutions being applied in the area of product and travel security. For example, our travel tracker system facilitates on-trip support through rapid identification of travellers in case of an emergency. It enables the Roche security team to contact colleagues who are travelling through in-built email and SMS. In 2018, we handled 54 emergency events and supported 860 people worldwide.

Counterfeit pharmaceuticals may be devoid of active ingredients but may contain harmful substances, state incorrect dosages, or be inappropriately packaged and labelled. Masquerading as medicines, they put patients at risk of treatment failure and dangerous side effects. Today's global trade system opens up possibilities for introducing counterfeit products into the regular supply chain. To coordinate counter efforts, we collaborate on international criminal investigations.

Roche, Genentech and Chugai are members of the Pharmaceutical Security Institute, which hosts a database with more than 14,000 product crime cases. Comparison of data provides the opportunity to identify specific logistics companies or distributors which then can be notified to law enforcement authorities. In 2018, Roche closed 377 suspected cases; of which 142 were confirmed.

We also use our internal analytical skills to examine samples of counterfeiting. Besides identifying the composition of the 'medicine', its impurities and contamination, scientists analyse the ink on packaging and leaflets, blisters and paper. We investigate counterfeits detected at different locations around the world to find out if they originated from the same source.



We employ several anti-counterfeit strategies to combat counterfeiting and help ensure the quality of our products.

These efforts, combined with the greater awareness of the authorities and stricter legislation, help ensure a safe supply of critical medicines for patients in need.

Anti-Counterfeiting:
roche.com/anti-counterfeiting

Business Continuity Management

In September 2017, Hurricane Maria left a trail of death and destruction in Puerto Rico. The island is home to one of Roche's three manufacturing sites for glucose test strips in the area of Diabetes Care. The storm impacted employees and the local affiliate as well. The Roche site was hit by a power outage and damage to the overall infrastructure. One substantial challenge in the aftermath of the storm was IT connectivity, especially access to the Roche network. All our employees worked hard to keep the impact of the disruption to a minimum. Preventing shortages of products for diabetes patients worldwide was only possible by having processes in place that focused on improving the resilience of our network. Today, the Puerto Rico affiliate is back to full operations.

Partnerships for a lasting future

With a view to further improving sustainable partnerships with patients, Roche updated its directive on collaborating with patient groups and patients in 2018. These guidelines acknowledge the role played by an increasingly empowered and more vocal patient population. In this directive, patients are defined broadly to include patient organisations, patient groups, patient associations, patient advocacy groups, patient communities, patient experts, online patient communities, family members, caregivers and individual patients.

Only by interacting with patients are we able to gain a greater understanding of what they need. The patient's perspective can guide us in clinical development, for example, in defining meaningful clinical trial endpoints. This is also reflected in the newly launched patient platform ForPatients that provides disease education as well as information on Roche clinical trials in layperson language. It further provides relevant information that makes it easier for caregivers and patients to connect to possible clinical trial sites.

Respect for privacy and data protection

We believe that access to and use of real-world data (RWD) for legitimate purposes benefits patients, provided appropriate safeguards are in place. In all our interactions, be it with patients or other stakeholders, we need to respect their privacy. This year, we adjusted our policy framework on data privacy in light of the new European Union General Data Protection Regulation (GDPR). We took the opportunity to evaluate current practices and developed a roadmap to ensure that all requirements of the GDPR are met. In addition, with the involvement of many stakeholders, Roche has elaborated a Position Paper on access and use of RWD. It explains why there is tremendous value

for patients and other stakeholders in RWD and how Roche accesses and uses RWD in its undertakings. In all our activities, we aim to ensure data protection while allowing the use of data to drive medical innovation.

Sustainability of supply and human rights

The United Nations Guiding Principles on Business and Human Rights are embedded in our operations by multiple means. We do this by assessing the risks of potential violations, promoting awareness, fostering due diligence, strengthening the legal framework and collaborating on collective actions, and transparent communication.

In 2018, we conducted a human rights risk assessment with cross-functional representatives. This was supported by the Corporate Sustainability Committee. We identified human rights which are potentially susceptible to violations, as well as their associated risks. To enhance awareness, we created a video that explained human rights and Roche's endeavours with a simple message to our employees: 'Within your sphere of influence, ensure human rights are respected.'

We carried out risk-assessments of our approximately 1,000 business-critical suppliers and broadened our supplier due diligence. In 2018, we also expanded collaboration with our business-critical suppliers to systematically identify and risk-assess critical tier 2 suppliers. We specifically looked at countries and industries with known high risks for violation of human rights. In total, we found more than 50 high-risk tier 2 suppliers. Among them were logistics companies in Nigeria and Thailand and temporary labour companies in Mexico. We verified that our tier 1 suppliers had mitigation plans in place with these suppliers.

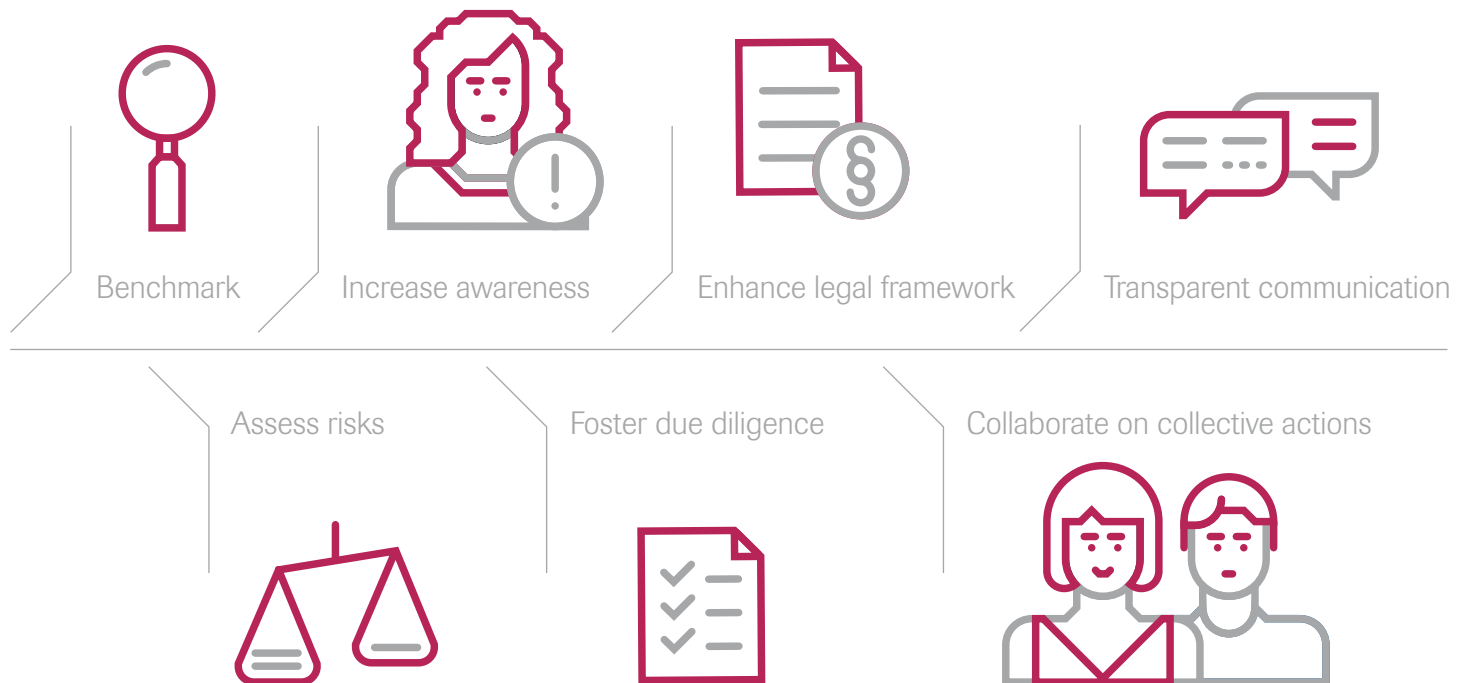
Patients:
[roche.com/
patientorganisations](https://roche.com/patientorganisations)

ForPatients:
forpatients.roche.com

Position on RWD:
roche.com/rwd

Human Rights:
[roche.com/approach/
human_rights](https://roche.com/approach/human_rights)

Human Rights approach



We also continued our supplier sustainability assurance visits with the support of external audit firms, and have completed 126 visits. In the area of labour conditions, we have had more than 100 findings. These include excessive overtime, improper pay for overtime, insufficient number of rest days, and inadequate payment of social benefits. We worked with these suppliers to address these findings. For example, a sustainability assurance visit at a Chinese supplier of pharmaceutical manufacturing equipment revealed unsatisfactory standards in working conditions, especially with regards to health and safety and the environment. Some of the workers had excessive overtime and received insufficient SHE¹ training. In addition, the company did not carry out regular fire drills. The supplier has since successfully implemented corrective actions.

Focus on abilities

The recognition of human rights ensures that people have a right to be treated with dignity. The RocheAbility network, for instance, fosters the inclusion of Basel and Kaiseraugst employees with disabilities and focuses on the strengths and abilities of each individual. The Basel and Kaiseraugst site has started to work with inclusive providers and plans to expand its collaborations, one example

being the Basel-based Bürgerspital, which provides important services for Roche. By introducing the inclusive internship programme, the local organisation also wants to further improve diversity in its workforce. The internship is open to people with varying disabilities, ranging from physical disabilities to neurodevelopmental conditions.

Engaging with public policy stakeholders

We are convinced that a responsible and constructive form of lobbying is in the interest of all parties involved and of society as a whole. We seek to inform and work closely with government officials in order to highlight and address the issues that affect the healthcare industry and advance its regulatory framework. In 2018, we updated our Good Practice Guidelines on working with government officials. Where appropriate, Roche discloses contributions and signs up to the transparency register of public authorities. In Switzerland, we spent CHF 8.7 million in 2018, which includes payments to industry associations and various chambers of commerce, financial assistance to trade unions, and donations to political parties at the cantonal and federal level. Donations to political parties are each in the low double-digit thousand range in Swiss francs, and together accounted for approximately 3% of total contributions and donations.

Public Policy:
[roche.com/
 approach/
 public-policy](https://roche.com/approach/public-policy)

¹ SHE = Safety, Security, Health and Environment



Dr Nicole Gusset, SMA Switzerland

“There is a red line that patient organisations should never cross.”

My daughter, Victoria, was diagnosed with spinal muscular atrophy (SMA) in 2011, a year after her birth. As a caregiver to a child with SMA, you need more of everything—time, space, money, energy, emotions. SMA affects all aspects of your life and is merciless. It is a killer that constantly tries to grab your child, with you trying to stay ahead of it and keep out of its reach.

Soon after the devastating diagnosis, I started with my efforts to contribute to the development of therapeutics and to make sure they would meet patients’ needs. I needed knowledge and partners for our battle, so I founded the patient organisation SMA Switzerland and joined forces with SMA Europe. My family gives me great support and Victoria is a constant motivator, my driving force. She helps me to raise the patient’s voice and pursue its inclusion in discussions and decision-making during drug development.

SMA Switzerland works closely with stakeholders in the drug development process and patient input is essential at all levels. In our cooperation with pharmaceutical companies, we currently provide expertise in working groups and advisory boards for protocol design, trial operations and communications.

This partnership can only work well when goals are clearly formulated and insight into internal processes

is granted. This helps us understand when and where inputs are relevant. Transparent communication and sharing of confidential information with patient organisations are needed in order for us to make a meaningful contribution. But there is a red line that patient organisations should never cross: The interest of patients and their wellbeing have to be at the centre of all decisions and actions, and there should be no compromises on that.

The healthcare industry is undergoing change, with increasing digitalisation and access to data, and with better informed, but demanding patients. Are there enough safeguards to protect the individual? Are we aware of potential consequences and can we make informed decisions? I like to think personal data belong to the individual, but I also see the incredible opportunity that lies ahead in applying big data. Surely, the fusion of discoveries from big “human” data with those from technological advancements will fundamentally change the face of medicine.

A Star Trek-like scenario where patients are scanned with a medical tricorder to identify their health status, and then re-scanned for treatment, may no longer be science fiction. Personally, for SMA, and in the nearer future, I foresee a combination of different therapies tailored to the patient’s personal needs, paired with graceful robotic devices that will replace the clumsy wheelchairs and mechanical aids of today.



Roche

Our Corporate Governance

principles put the focus of our business activities on sustainable value creation and innovation and prescribe a management culture conforming to recognised standards of good corporate governance and a policy of transparent communication.

Roche is continuously modernising its infrastructure to ensure successful and sustainable operations.

Principles

Roche's corporate governance principles put the focus of its business activities on sustainable value creation and innovation and prescribe a management culture conforming to recognised standards of good corporate governance and a policy of transparent communication. These principles build the basis for the successful implementation of Roche's commitment to serving all its stakeholders.

A strong Board of Directors, which represents the interests of the shareholders and all other stakeholders, and highly skilled managers that act with integrity are extremely important.

In 2018, for the 10th consecutive year, Roche has been recognised as the most sustainable company in the Pharmaceuticals index of the Dow Jones Sustainability Indices (DJSI). This is based on an in-depth analysis of economic, social and environmental performance. The DJSI serve as a benchmark for investors who integrate sustainability considerations into their portfolios. Sustainability is at the core of our business practices and this award reflects our commitment to running our business in a way that is ethical, responsible and creates long-term value for stakeholders.

This Corporate Governance Report sets out the structures, processes and rules which Roche takes as the basis for well-functioning corporate governance.

In doing so, Roche complies with all relevant corporate governance requirements, in particular with all applicable laws, the Swiss Stock Exchange (SIX Swiss Exchange) directives and the Swiss Code of Best Practice for Corporate Governance promulgated by the Swiss business federation 'economiesuisse'. The company's internal governance framework, particularly its Articles of Incorporation and Bylaws, embodies all the principles needed to ensure that the company's businesses are managed and supervised in a manner consistent with good corporate governance, including the necessary checks and balances.¹

The printed Annual Report contains selected links to the Roche website (www.roche.com). Readers are thus provided not only with a 'snapshot' of our company at the reporting date but are also directed to sources which they can consult at any time for up-to-date information about corporate governance at Roche. Whereas each annual report covers a single financial year ending 31 December, our website contains information of a more permanent nature, as well as the latest Roche news. The company's Articles of Incorporation, Bylaws and the curricula vitae of current and former members of the Board of Directors and the Corporate Executive Committee are published on our website.

For further details please refer to the following report.

Annual General Meeting

Annual General Meeting

Board of Directors

Board of Directors and Board Committees

Board Committees

Presidium and Nomination Committee

Remuneration Committee

Audit Committee

Corporate Governance and Sustainability Committee

Corporate Executive Committee

Corporate Executive Committee

CEO Roche Group	CEO Pharmaceuticals	CEO Diagnostics	CFO	HR	General Counsel
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Enlarged Corporate Executive Committee

Enlarged Corporate Executive Committee

gRED	pRED	Partnering	Communications
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¹ roche.com/governance

Board of Directors

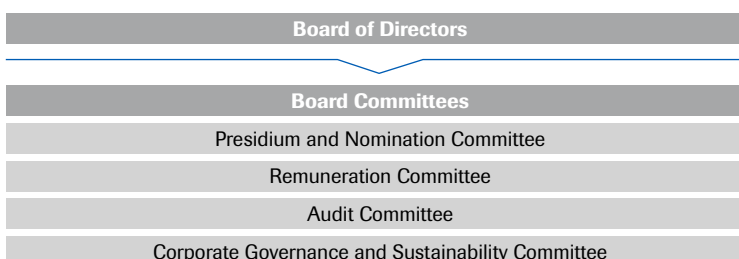
At the 100th Annual General Meeting (AGM) of Roche Holding Ltd, on 13 March 2018, shareholders re-elected Dr Christoph Franz as Chairman of the Board of Directors.

Furthermore, the AGM re-elected André Hoffmann, Prof. Sir John Bell, Julie Brown, Paul Bulcke, Anita Hauser, Prof. Dr Richard P. Lifton, Dr Andreas Oeri, Bernard Poussot, Dr Severin Schwan, Dr Claudia Suessmuth Dyckerhoff and Peter R. Voser for a term of one year as provided by the Articles of Incorporation.

In addition, the AGM elected Dr Christoph Franz, André Hoffmann, Prof. Dr Richard P. Lifton, Bernard Poussot and Peter R. Voser as members of the Remuneration Committee.

At its organising meeting immediately following the AGM, the Board of Directors has determined the structure and composition of its remaining committees as shown below (see also pages 14 to 15 and page 112 'Board of Directors and Corporate Executive Committee').

Board of Directors and Board Committees



Composition as at 31.12.2018	Name (year of birth)			First elected
Board of Directors	Dr Christoph Franz (1960)	C, D*, E	Chairman	2011
	André Hoffmann (1958) (representative of the shareholder group with pooled voting rights)	A, C*, D, E	Vice-Chairman	1996
	Dr Andreas Oeri (1949) (representative of the shareholder group with pooled voting rights)	A*, E		1996
	Prof. Sir John Bell (1952)	B, E		2001
	Julie Brown (1962)	B*, E		2016
	Paul Bulcke (1954)	B, E		2011
	Anita Hauser (1969)	A, E		2017
	Prof. Dr Richard P. Lifton (1953)	C, E		2015
	Bernard Poussot (1952)	C, E		2015
	Dr Severin Schwan (1967)	F		2013
	Dr Claudia Suessmuth Dyckerhoff (1967)	A, B, E		2016
	Peter R. Voser (1958)	C, E		2011
	Secretary to the Board of Directors	Dr Gottlieb A. Keller (1954)		
Honorary Chairman of the Board of Directors	Dr Fritz Gerber (1929)			

A Corporate Governance and Sustainability Committee

B Audit Committee

C Remuneration Committee

D Presidium/Nomination Committee

E Non-executive director

F Executive director

* Committee chairperson

On 5 March 2019, at the forthcoming AGM the Board of Directors nominates the Chairman and all remaining members of the Board of Directors for re-election.

In addition, the Board of Directors proposes Prof. Dr Hans Clevers, Professor of Molecular Genetics, University Medical Center Utrecht, the Netherlands, for election to the Board of Directors at the 2019 AGM.

Moreover, the Board of Directors nominates Dr Christoph Franz, André Hoffmann, Prof. Dr Richard P. Lifton, Bernard Poussot and Peter R. Voser for re-election as members of the Remuneration Committee at the AGM in 2019.

On 26 July 2018, Roche announced that Dr Andreas Oeri had informed the Board of Directors that he will not stand for re-election as a member of the Board of Directors at the Annual General Meeting 2020. This will conclude his 24-year term of office. Dr Jörg Duschmalé, a fifth-generation descendant of the founder of Roche, has confirmed his interest in standing for election as a member of the Board of Directors in 2020.

As in the previous year, the Board of Directors nominates BDO AG as the independent proxy for the period from 2019 until the conclusion of the 2020 ordinary Annual General Meeting of Shareholders for election by the AGM.

Corporate Executive Committee

Daniel O'Day, CEO Roche Pharmaceuticals and member of the Corporate Executive Committee, stepped down from his role as of 31 December 2018. Until the end of February 2019 and prior to assuming new responsibilities outside of Roche, he will provide his support to ensure a smooth transition of activities.

William (Bill) Anderson, former CEO of Genentech, was appointed CEO Roche Pharmaceuticals effective 1 January 2019 and as a new member of the Corporate Executive Committee is reporting to Dr Severin Schwan, CEO Roche Group.

Roland Diggelmann, CEO Roche Diagnostics and member of the Corporate Executive Committee, left Roche to pursue his career outside of the company effective 30 September 2018. Until a successor is named, Dr Michael Heuer, former Head of Regions Europe, Middle East and Africa, and Latin America for Roche Diagnostics, has assumed the ad interim leadership of Roche's Diagnostics Division and has become a member of the Corporate Executive Committee.

Corporate Executive Committee

Corporate Executive Committee					
CEO Roche Group	CEO Pharmaceuticals	CEO Diagnostics	CFO	HR	General Counsel

Enlarged Corporate Executive Committee

Enlarged Corporate Executive Committee			
gRED	pRED	Partnering	Communications

Composition as at 31.12.2018	Name (year of birth)	Position	Since
Corporate Executive Committee	Dr Severin Schwan (1967)	CEO Roche Group	2008
	Daniel O'Day (1964)	CEO Roche Pharmaceuticals	2010
	Dr Michael Heuer (1954)	CEO Roche Diagnostics a. i.	2018
	Dr Alan Hippe (1967)	Chief Financial and IT Officer	2011
	Cristina A. Wilbur (1967)	Head Group Human Resources	2016
	Dr Gottlieb A. Keller (1954)	General Counsel	2003
Enlarged Corporate Executive Committee	Dr Michael D. Varney (1958)	Head Genentech Research & Early Development (gRED)	2015
	Dr William Pao (1967)	Head Roche Pharma Research & Early Development (pRED)	2018
	Dr James H. Sabry (1958)	Global Head of Pharma Partnering	2018
	Dr Stephan Feldhaus (1962)	Head Group Communications	2010
Secretary to the Corporate Executive Committee	Per-Olof Attinger (1960)		
Statutory Auditors of Roche Holding Ltd	KPMG Klynveld Peat Marwick Goerdeler SA (reporting years 2004–2008)		
	KPMG AG (since 2009)		
	Auditor in charge: John A. Morris (2004–2010)		
	Ian Starkey (2011–2017) Mark Baillache (as of business year 2018)		
Chief Compliance Officer	Dr Urs Jaisli (1956)		

Prof. John C. Reed, Head Roche Pharma Research & Early Development (pRED), left Roche for personal reasons in April 2018 in order to return to the United States. Effective 2 April 2018, William Pao, former Global Head of the Oncology Discovery and Translational Area for pRED, has been appointed as his successor and as a member of the Enlarged Corporate Executive Committee.

Effective 31 July 2018, Dr Sophie Kornowski-Bonnet, Head Roche Partnering and member of the Enlarged Corporate Executive Committee, has left the company to pursue her career outside of Roche. Effective 1 August 2018, Dr James H. Sabry, former global

Head Genentech Partnering, has been appointed Global Head of Pharma Partnering and as a new member of the Enlarged Corporate Executive Committee. This new role combines the Genentech and Pharma Partnering functions. Furthermore, Osamu Nagayama retired from the Enlarged Corporate Executive Committee which he joined in 2006.

Information on each member of the Corporate Executive Committee and of the Enlarged Corporate Executive Committee is listed above (see also pages 18 to 19 and page 112 'Board of Directors and Corporate Executive Committee').

Group structure and shareholders

Roche's operating businesses are organised into two divisions: Pharmaceuticals and Diagnostics. The Pharmaceuticals Division comprises the two business segments Roche Pharmaceuticals and Chugai, whereas Genentech as the former third segment has been

integrated into Roche Pharmaceuticals. The Diagnostics Division consists of the following four business areas: Centralised and Point of Care Solutions, Molecular Diagnostics, Tissue Diagnostics and Diabetes Care.

Pharmaceuticals

Roche Pharmaceuticals (incl. Genentech)

Chugai

Diagnostics

Centralised and Point of Care Solutions

Molecular Diagnostics

Tissue Diagnostics

Diabetes Care

Composition as at 31.12.2018

Dr Andreas Oeri, Chairman of the Corporate Governance and Sustainability Committee, and André Hoffmann, Chairman of the Remuneration Committee.



Business activities are carried out through Group subsidiaries and associated companies. Detailed information on Roche Holding Ltd and on significant subsidiaries and associated companies (including company name, listing information, domicile, share capital, and equity interest) is listed in the Finance Report, Note 32 to the Roche Group Consolidated Financial Statements ('List of subsidiaries and associates', page 122).

Major shareholders are listed in the Finance Report, Notes 22 and 31 to the Roche Group Consolidated Financial Statements ('Equity attributable to Roche shareholders' and 'Related parties', pages 89 and 120), and in Note 4 to the Financial Statements of Roche Holding Ltd ('Significant shareholders', page 169). In addition, significant shareholders are published on the relevant webpage of the disclosure office of SIX Exchange Regulation.

André Hoffmann, Vice-Chairman of the Board of Directors and Chairman of the Remuneration Committee, and Dr Andreas Oeri, member of the Board of Directors and Chairman of the Board's Corporate Governance and Sustainability Committee, serve in their respective capacities on the Board and its committees as representatives of the shareholder group with pooled voting rights and receive the remuneration set forth in the Remuneration Report on page 132 and in the Finance Report, Note 31 to the Roche Group Consolidated Financial Statements ('Related parties', page 120). With the exception of Dr Jörg Duschmalé, who worked as a post-doc at Roche until the end of September 2018, no other relationships exist with the shareholders with pooled voting rights.

There are no cross-shareholdings.

SIX Exchange
Regulation:
[six-exchange-regulation.com/en/home/publications/significant-shareholders](https://www.six-exchange-regulation.com/en/home/publications/significant-shareholders)

Capital structure

Information on Roche's capital structure is provided in the Finance Report, Notes to the Financial Statements of Roche Holding Ltd (page 168). Additional details are contained in the Articles of Incorporation of Roche Holding Ltd.²

Movement in recognised amounts during the last three financial years are detailed in the Finance Report, Notes to the Financial Statements of Roche Holding Ltd (page 169).

The company has a share capital of CHF 160,000,000, divided into 160,000,000 fully paid bearer shares with a nominal value of CHF 1 each. There are no restrictions on the exercise of the voting rights of these shares. Upon deposit, shares can be voted without any restrictions.

There is no authorised or conditional capital.

In addition, 702,562,700 non-voting equity securities (NES) have been issued in bearer form. They do not form part of the share capital and confer no voting rights. Each NES confers the same rights as one share to participate in available earnings and in any liquidation proceeds following repayment of the share capital. Roche's NES and the rights pertaining thereto (including the provisions

protecting the interests of NES holders) are described in §4 of the Articles of Incorporation of Roche Holding Ltd.

Information on debt instruments which have been issued and on outstanding bonds is provided in the Finance Report, Note 21 to the Roche Group Consolidated Financial Statements ('Debt', page 85).

Information on employee stock options is provided in the Finance Report, Note 27 to the Roche Group Consolidated Financial Statements ('Equity compensation plans', page 103), including detailed information on the Stock-settled Stock Appreciation Rights (S-SARs) Plan, the Restricted Stock Units (RSUs) Plan, the Performance Share Plan (PSP), Roche Connect and the Roche Option Plan.

Roche has issued no options apart from employee stock options as described in the Finance Report, Note 27 to the Roche Group Consolidated Financial Statements ('Equity compensation plans', page 103) and options issued in connection with debt instruments.

Neither the options awarded to employees nor the debt instruments which have been issued have any effect on Roche's share capital.

² [roche.com/article_of_incorporation](https://www.roche.com/article_of_incorporation)

Board of Directors and Corporate Executive Committee

Information on each member of the Board of Directors and on each member of the Corporate Executive Committee is listed on pages 107 and 109. Members of the Board of Directors have no age limit or restriction on their term of office. Curricula vitae of all current and former members (of the last five years) of both bodies and other information (including information on the years of their first election, additional positions, memberships and activities) are available and continuously updated on the Internet.³

Rules pursuant to article 12 para. 1 point 1 VegüV on the number of permitted activities of the Board of Directors and the Corporate Executive Committee members are outlined in §22.4 of the Articles of Incorporation of Roche Holding Ltd.⁴

Since 2014, the Annual General Meeting has elected all members of the Board of Directors, the Chairman of the Board of Directors and the members of the Remuneration Committee on an annual basis in elections in which each nominee is voted on separately (see §18 of the Articles of Incorporation of Roche Holding Ltd⁴ and the Minutes of the 100th Annual General Meeting of Roche Holding Ltd, held on 13 March 2018⁵).

With the exception of Dr Severin Schwan none of the members of the Board of Directors in office at the end of 2018 has been a member of Roche's Corporate Executive Committee or served in an executive capacity at any Group subsidiary during the five financial years preceding the current reporting

period and they are for lack of existing business connections with any Group subsidiary independent. Roche's Board of Directors' independence definition is based on the definition in the Swiss Code of Best Practice for Corporate Governance of 'economiesuisse' and is complemented by specific preceding criteria (see roche.com/board_of_directors).

The Principles of Governance (principles of delegation and competence, reservation of powers and management of a group of companies) of the executive bodies of the company include economic, environmental and social topics. The principles together with the internal organisation of the Board of Directors, the division of authority and responsibilities between the Board and management, the remits of the Board Committees, and the information and control mechanisms available to the Board in its dealings with corporate management, are governed by the Bylaws.⁶

The Board of Directors of Roche Holding Ltd is organised so as to ensure that the Group conducts its businesses responsibly and with a focus on long-term value creation. To this end, the Roche Board has delegated certain responsibilities to several committees.⁷ Their composition and chairpersons as at 31 December 2018 are described on page 107. Each committee's authorities and responsibilities are defined in detail in the Bylaws of the Board of Directors.⁸

All the committees are chaired by independent directors.

³ roche.com/board_of_directors and roche.com/executive_committee

⁴ roche.com/article_of_incorporation

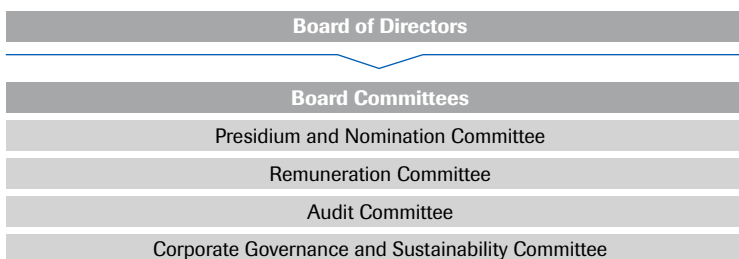
⁵ roche.com/annual_general_meetings

⁶ roche.com/article_of_incorporation

⁷ roche.com/committees

⁸ roche.com/article_of_incorporation

Board of Directors and Board Committees



Corporate Executive Committee

According to the Bylaws of the Board of Directors, a Board meeting may be convened without the Chairman present at the request of any of its members. The Roche Board meets once a year to assess the Chairman's performance. This meeting, which is not attended by the Chairman, is chaired by the Vice-Chairman.

As part of the Management Information System (MIS), the Board of Directors is regularly informed about the most important issues, sales performance, etc. The Board has access to an electronic information platform which provides timely information to the Board of Directors and the Board's committees as does the system of controls as set forth below.

The Board of Directors has established a system of controls which is continuously monitored by the Audit Committee, by the Corporate Governance and Sustainability Committee and by the Board of Directors and consists of the following elements:

- Report on operating and financial risks (risk management system)
- The Roche Group has established a risk management process covering the entire company with a system in place to identify and manage all types of risks potentially affecting its business (including economic, environmental and social impacts, risks and opportunities and containing stakeholder input). The Board of Directors is the highest governance body involved. Roche's Risk Management Policy sets out the approach and accompanying responsibilities.

The Pharmaceuticals and Diagnostics Divisions and global functions conduct a formal risk assessment process at least once a year and must develop risk plans for their most material risks. These are monitored and deviations reviewed in regular performance dialogues. The consolidated Group Risk Report including target risk profile is discussed by the Corporate Executive Committee and approved together with the Group Business Plan. All material risks are reviewed by the Board on a yearly basis. The effectiveness of the risk management process is monitored by the Group Risk Advisory team and the overall process is regularly reviewed by external auditors, with findings presented to the Audit Committee and the full Board. For details on risk management, including risk factors and the Risk Management Policy, see 'Risk Management' on our website.⁹ Financial risk management is specifically described in the Finance Report.¹⁰

- System of internal controls over financial reporting (see pages 141 and 150 of the Finance Report)
 - Internal audit
- Group Audit reports to the General Counsel, has direct access and gives regular briefings to the Audit Committee and to the Corporate Governance and Sustainability Committee about ongoing activities and audit reports. The Chief Audit & Risk Advisory Executive attends the Audit Committee and partly the Corporate Governance and Sustainability Committee meetings, as do the external auditors. Group Audit is an independent appraisal function which evaluates and reviews the Group's activities as a service to

⁹ [roche.com/risk-management](https://www.roche.com/risk-management)

¹⁰ Additional information is provided in the Finance Report, Note 30 to the Roche Group Consolidated Financial Statements, 'Risk management', page 109.

management. The annual audit plan with yearly defined focus areas (eg, market access, third-party management) is validated by Senior Management and presented to the Audit Committee. The Roche Group is committed to maintaining a high standard of internal control throughout its worldwide operations. Management is responsible for assessing the business risks in all aspects of its operation and for implementing effective and efficient processes and controls whilst ensuring compliance with internal and external rules and regulations.

By conducting operational audits, Group Audit determines management's response to the risks surrounding business processes and systems, and evaluates the appropriateness, completeness and efficiency of the processes and controls. Action plans to implement necessary changes and enhancements are developed together with the business/auditee and are tracked to completion.

- Statutory auditors, see page 117
- Chief Compliance Officer and Compliance Officers in subsidiaries, see page 119
- Safety, Health and Environmental Protection Department¹¹
- Corporate Sustainability Committee¹²
- Science and Ethics Advisory Group (SEAG), for issues relating to genetics and genetic engineering¹³

The members of the Corporate Executive Committee are invited to attend meetings of the Board of Directors for, and report in person on, those agenda items concerning them. When the situation warrants, members of the Enlarged Corporate Executive Committee may also be invited to attend. The Board Committees invite the Chairman of the Board and Corporate Executive Committee members to deliver reports at committee meetings and may elect to commission independent expert reports and call on the services of consultants.

Each year several black-out periods are imposed during which senior employees are prohibited from

trading in company stock. The following black-out periods are in effect for 2019:

26 December 2018 to 31 January 2019

1 April to 17 April 2019

26 June to 25 July 2019

1 October to 16 October 2019

Black-out periods can be changed by the Chairman of the Board of Directors if circumstances warrant.

In 2018, the Board of Directors met for 9 meetings, generally each from 3 to 6 hours in length, including a full-day meeting, and in addition for a 4-day visit to a major subsidiary.**

The Board Committees met as follows in 2018:

- Presidium of the Board of Directors/Nomination Committee: 9 meetings (approx. 2 hours each**)
- Remuneration Committee: 4 meetings¹⁴ (approx. 2 to 3 hours each**)
- Audit Committee: 5 meetings (approx. 3 to 4 hours each**)
- Corporate Governance and Sustainability Committee: 3 meetings (approx. 3 hours each**)

The Board of Directors regularly conducts an assessment (self-assessment/assessment by third parties via electronic survey and personal interviews) of its performance. In 2018, a third-party evaluation was conducted.

Members of the Corporate Executive Committee have a maximum ordinary notice period of twelve months. There are no change-of-control clauses in the employment contracts.

There are no management contracts which fall within the scope of Subsection 4.4 (annex) of the SIX Directive on Information relating to Corporate Governance.

¹¹ roche.com/environment

¹² roche.com/sustainability

¹³ roche.com/ethical_conflicts

¹⁴ Remuneration Committee members recuse themselves from deliberations and decisions on matters that affect their interests.

** These figures indicate the actual length of meetings and do not include the directors' extensive pre-meeting preparations and post-meeting follow-up activities.



Dr Andreas Oeri, Chairman of the Corporate Governance and Sustainability Committee.

Attendance at Board and Board Committee meetings in 2018

	Board	Presidium/ Nomination Committee	Remuneration Committee	Audit Committee	Corporate Governance and Sustainability Committee
Number of meetings	9	9	4	5	3
Ch. Franz	9	9	4	-	-
A. Hoffmann	9	9	4	-	3
J. Bell	7	-	-	5	-
J. Brown	9	-	-	5	-
P. Bulcke	7	-	-	5	-
A. Hauser	9	-	-	-	3
R.P. Lifton	8	-	4	-	-
A. Oeri	7	-	-	-	3
B. Poussot	9	-	4	-	-
S. Schwan	9	-	-	-	-
C. Suessmuth Dyckerhoff	7	-	-	5	3
P.R. Voser	8	-	4	-	-

- Not a member of that committee

Remuneration, shareholdings and loans

All details regarding remuneration, shareholdings and loans (content and method of determining the compensation and the shareholding programmes, basic principles and elements of compensation and shareholding programmes for serving and former members of the Board of Directors and Corporate Executive Committee, together with a description of the authorities and procedure for determining such) are set forth in the separate Remuneration Report on pages 120 to 146 and in the Finance Report, Notes 22 and 31 to the Roche Group Consolidated Financial Statements ('Equity attributable to Roche shareholders' and 'Related parties', pages 89 and 120), and are listed in Note 6 to the Financial Statements of Roche Holding Ltd ('Board and Executive shareholdings', page 170).

The following rules on remuneration, shareholdings and loans for the Board of Directors (Board) and the Corporate Executive Committee (CEC) are set forth in the Articles of Incorporation (AoI)¹⁵:

Content	Rules in AoI ¹⁵ for	
	Board	CEC
Rules on the principles applicable to performance-related pay	\$25.1–6	\$25.1–6
Rules on the principles to the allocation of equity securities, convertible rights and options	\$25.7	\$25.7
Additional amount for payments to members of the Executive Committee appointed after the vote on pay at the General Meeting of Shareholders		\$24.5
Rules on loans, credit facilities and post-employment benefits	\$25.1 and 3	\$25.2 and 3
Rules on the vote on pay at the AGM	\$24	\$24

Participatory rights of shareholders

The participatory rights of shareholders are defined in Roche's Articles of Incorporation.¹⁵ As Roche shares are issued to bearer, there are no restrictions on admission to Annual General Meetings, with the exception that shares must be deposited within a specified period before the date of a meeting and an admittance card must be issued in the shareholder's name, as provided in §12 of the Articles of Incorporation. Any shareholder can elect to be represented by a third party at an Annual General Meeting.

The Articles of Incorporation contain no restrictions on the exercise of voting rights, and the only quorum requirements are those stipulated in §16, in conformity with the Swiss Code of Obligations.

Under §10.2 of the Articles of Incorporation, shareholders representing shares with a nominal value of at least CHF 1 million can request the placement of items on the agenda of an Annual General Meeting. This must be done no later than 28 days before the date of the meeting.

The rules on the issue of instructions to the independent proxy and rules on the electronic participation in the AGM are laid down in the corresponding invitation to the AGM and are not regulated in the Articles of Incorporation.

¹⁵ roche.com/article_of_incorporation

Change of control and defensive measures

The Articles of Incorporation contain no provisions on the mandatory bid rule. Swiss law applies.

There are no change-of-control clauses. Those components of remuneration based on Roche NES

would be terminated in the event of an acquisition, and vesting period restrictions on pre-existing awards would be removed, so that all such options could be exercised immediately.

Relationship to statutory auditors

At the Annual General Meeting of Roche Holding Ltd on 13 March 2018, the shareholders voted to appoint KPMG AG (KPMG) as statutory auditors.

Based on the existing legal requirements of the Swiss Code of Obligations (Article 730a) concerning the maximum term of office of seven years of the auditor in charge, Ian Starkey as auditor-in-charge since business year 2011 was replaced by Mark Baillache starting with the business year 2018 (information on how long the auditors and auditor-in-charge have been serving in these capacities is provided on page 109). The statutory auditors participate in Audit Committee meetings. They prepare written and oral reports on the results of their audits. The Audit Committee oversees and assesses the auditors and makes recommendations to the Board (for information on the authorities and responsibilities of the Audit Committee, see Article 8.1 of the Bylaws¹⁶). The statutory auditors participated in all 5 meetings of the Audit Committee in 2018.

The reports of the statutory auditor on the Consolidated Financial Statements and on the Financial Statements can be found on pages 142 and 174, respectively, of the Finance Report.

KPMG received the following remuneration for their services as statutory auditors of Roche Holding Ltd and as the auditors of other Roche companies (including Chugai):

	2018	2017
	(millions of CHF)	
Auditing services	21.7	21.0
Audit-related services		
– Assurance	0.7	0.5
– Non-statutory audits	–	–
Tax services	2.1	1.4
Other services	0.4	0.4
Total	24.9	23.3

The statutory auditors are elected each year by the Annual General Meeting.

Auditing services are provided as legally required.

Audit-related services include assurance and accounting services provided by auditors but which are not necessarily provided by the statutory auditor. These services which go beyond the legal requirements could include other attestation services, comfort letters, consents and consultations.

Tax services include services with respect to compliance, tax returns and tax advice except those services related to the audit of tax.

Other services include advice relating to process improvements, regulations and trainings.

¹⁶ roche.com/article_of_incorporation

The company has a formal policy governing the engagement of the statutory auditor for non-audit services. The policy prohibits certain services from being provided but permits certain other services

up to limits agreed by the Audit Committee. Each potential non-audit service engagement is reviewed against this policy before any authority to proceed is given.

Relationship to the independent proxy

In recent years, BDO AG served as the independent proxy and at the Annual General Meeting on 13 March 2018, shareholders elected BDO AG as the independent proxy for the period from 2018 until the conclusion of the 2019 ordinary Annual General Meeting of Shareholders. BDO AG was paid for its services for the Annual General Meeting 2018 according to expenditure totalling CHF 13,736 (2017: CHF 16,848).

The rules on the issue of instructions to the independent proxy and rules on the electronic participation in the AGM are laid down in the corresponding invitation to the AGM and are not regulated in the Articles of Incorporation.

Information policy

As provided by §34 of the Articles of Incorporation¹⁷, corporate notices are published in the Swiss Official Gazette of Commerce and in other daily newspapers designated by the Board of Directors ('Basler Zeitung', 'Finanz und Wirtschaft', 'L'Agefi', 'Le Temps', 'Neue Zürcher Zeitung').

Roche reports its half-year and full-year results in business reports (published in print and/or online formats) and at media events. In addition, detailed first-quarter and nine months sales figures are published each year in April and October. The most current list of publication dates is available in English and German on the Internet.¹⁸

All relevant information and documents, including all media releases, investor updates¹⁹ and presentations to analyst and investor conferences are available on the Internet. Further publications are available on roche.com/publications or can be ordered by e-mail: basel.warehouse-services@roche.com or fax: +41 (0)61 688 69 02

The contact address for Investor Relations is:
F. Hoffmann-La Roche Ltd, Investor Relations,
Group Finance, 4070 Basel, Switzerland
tel.: +41 (0)61 688 88 80
fax: +41 (0)61 691 00 14

Additional information, including details on specific contact persons, is available on the Internet.²⁰

¹⁷ roche.com/article_of_incorporation

¹⁸ roche.com/media

¹⁹ roche.com/investors

²⁰ roche.com/investors/contacts

Chief Compliance Officer and Compliance Officers network

The Chief Compliance Officer with his Compliance Officers network is committed to ensuring that the Roche Group Code of Conduct²¹ is consistently complied with throughout the Roche Group. He also serves as a contact person for shareholders, employees, customers, suppliers and the general public on issues relating to the implementation of and compliance with this Code. Employees and other parties who become aware of violations of the Roche Group Code of Conduct can bring them to the attention of their managers or supervisors, to the local Compliance Officer or report them to the Chief Compliance Officer (Dr Urs Jaisli, direct phone number: +41 (0)61 688 40 18, e-mail: urs.jaisli@roche.com). Such disclosures will be treated confidentially. In addition, as of the end of 2009, employees may anonymously report irregularities or complaints in their mother tongue via a 'SpeakUp Line'. Starting in December 2013, a new compliance tool on Group level, the so-called Roche Group Code of Conduct Help & Advice Line, was introduced which strives to provide guidance in case of questions or uncertainties about the interpretation of the Roche Group Code of Conduct and its reference documents. It furthermore will serve as a platform for ideas and suggestions concerning those documents.

In addition, Roche has established a Business Ethics Incident Reporting (BEIR) system which enables the Chief Compliance Officer to capture, track and monitor alleged violations, from initial reports by local Compliance Officers through to resolution.

Business ethics incidents are recorded in the system when the Group Internal Investigation department or the regional/local management receives specific and concrete information about an alleged violation of the Roche Group Code of Conduct in one of certain pre-defined categories.²² The Corporate Governance and Sustainability Committee and the Audit Committee of the Board of Directors are informed of substantial violations and management's corrective actions made.

The Chief Compliance Officer reports to the General Counsel and also submits regular reports to the Corporate Governance and Sustainability Committee and as needed to the Audit Committee of the Board of Directors.

Non-applicability/negative disclosure

It is expressly noted that any information not contained or mentioned herein is either non-applicable or its omission is to be construed as a negative declaration

(as provided in the SIX Swiss Exchange Corporate Governance Directive and the Commentary thereto).

²¹ roche.com/code_of_conduct

²² roche.com/risk-management





Material topics covered in this chapter
Executive remuneration

Our
**Remuneration
Report**

shows the commitment to a fair, performance-based and results-oriented compensation policy that links employees' interests with those of various other stakeholder groups.

Modern and attractive conditions are key aspects for Roche's interaction with its employees, partners and society in general.

1. Principles

Roche's success depends substantially on the expertise, motivation and performance of its employees. This conviction forms the basis of our compensation policy.

Roche aims to remunerate all employees fairly, transparently and in line with market conditions, to enable them to participate appropriately in the company's success. We pursue this goal by providing competitive, performance-based and results-oriented compensation.

We strive for a balanced mix of fixed and variable compensation components geared to each employee's position and management responsibility.

Compensation
policy:
[roche.com/
rewards](https://roche.com/rewards)

Sound value
system:
[roche.com/
living_our_
values](https://roche.com/living_our_values)

Firstly, the variable components are intended to create additional financial incentives to achieve corporate goals and to keep innovation at a consistently high level while increasing the value that the company creates for all stakeholder groups. Secondly, in order to allow employees and managers to participate in the company's business success, adequate compensation measures are key. Both objectives are incentivised by annual bonus payments and long-term securities-based programmes.

For a global company like Roche, market-competitive remuneration plays a key role along with a performance-based, transparent compensation structure. To ensure that compensation packages are competitive, both the structure and individual components are regularly benchmarked against Swiss, European and international criteria. Our remuneration guidelines and their underlying principles are also subject to regular outside comparisons.

However, compensation policy is only one factor in safeguarding Roche's future success. Another key element is a corporate culture that offers employees conditions in which they can make their best possible contribution to the shared corporate goal of improving healthcare to patients. This includes a sound value system that is based on integrity, courage and passion. At the same time, our decentralised management approach plays a major role with its wide scope for individual decision-making, respectful interactions, openness to diversity, wide-ranging training and development opportunities and an attractive working environment. An unidimensional diminishment to questions on remuneration would fall by far too short.

Roche is committed to a fair, performance-based and results-oriented compensation policy that links employees' interests with those of various other stakeholder groups.

2. Remuneration decision process and approval framework

2.1 Overview

Each year the Remuneration Committee of Roche's Board of Directors decides the remuneration of Board members and the members of the Group's Corporate Executive Committee.

The terms of the long-term oriented Performance Share Plan (PSP) awards are decided annually by the Board of Directors, acting upon recommendations from the Remuneration Committee (as of 2019 see 3.1.6).

Remuneration decision process and approval framework

Remuneration components	Beneficiary		Decision by	Approval by
	Board of Directors (BoD) Chairman (C)	Corporate Executive Committee (CEC) incl. CEO Roche Group		
Base pay/remuneration	√	√	Remuneration Committee	Annual General Meeting
Bonus	√ (C only)	√		
Stock-settled Stock Appreciation Rights	-	√		
Performance Share Plan	-	√	Board of Directors upon recommendation from Remuneration Committee	
Decisions on pension	√ (C only)	√	Remuneration Committee	

The Remuneration Committee tracks market data on salaries at other leading global pharmaceutical companies¹ and at major Swiss companies² and reports its findings to the full Board. The external consulting firm PricewaterhouseCoopers (PwC) assists the Remuneration Committee of Roche in performing market comparisons and in advising. Information on the Remuneration Committee's remit, powers and procedures for making remuneration decisions can be found in the Bylaws of the Roche Board of Directors³ and in the Articles of Incorporation.⁴ They are also outlined in the sections below on the principles governing specific remuneration components (see 3.).

Since 2014, total aggregate amounts which are based on these decisions have been submitted to the General Meeting for approval implementing the 'Ordinance against excessive compensation in listed corporations' (Verordnung gegen übermässige Vergütungen bei börsenkotierten Aktiengesellschaften [VegüV]). The General Meeting shall vote annually and with binding effect on the approval of the remuneration (that the Board of Directors has resolved) of the Board of Directors and the Corporate Executive Committee (for details see 4. and 5.).

¹ Peer set for 2018: Abbott Laboratories, AbbVie, Amgen, Astellas, AstraZeneca, Bayer, Bristol-Myers Squibb, Eli Lilly, GlaxoSmithKline, Johnson & Johnson, Merck & Co., Novartis, Pfizer, Sanofi, Takeda (no change in composition of peer set compared to 2017).

² ABB, Credit Suisse, LafargeHolcim, Nestlé, Sonova, Straumann, Swiss Re, UBS, Zurich Insurance.

³ [roche.com/article_of_incorporation](https://www.roche.com/article_of_incorporation)

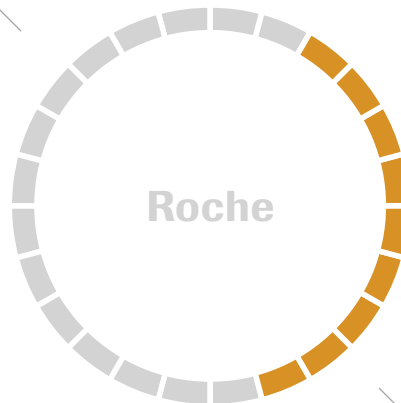
⁴ [roche.com/article_of_incorporation](https://www.roche.com/article_of_incorporation)



André Hoffmann, Chairman of the Remuneration Committee.

Peer set for 2018

- Abbott Laboratories
- AbbVie
- Amgen
- Astellas
- AstraZeneca
- Bayer
- Bristol-Myers Squibb
- Eli Lilly
- GlaxoSmithKline
- Johnson & Johnson
- Merck & Co.
- Novartis
- Pfizer
- Sanofi
- Takeda



- ABB
- Credit Suisse
- LafargeHolcim
- Nestlé
- Sonova
- Straumann
- Swiss Re
- UBS
- Zurich Insurance

Peer set for 2018

Market comparison companies for salary assessment

- Pharma peer set
- Major Swiss companies

2.2 Procedure for submitting total Board and Executive remuneration for shareholder approval at the Annual General Meeting

Each year at the Annual General Meeting (AGM) shareholders approve the total remuneration for the Board of Directors and for the Corporate Executive Committee as decided by the Board of Directors' Remuneration Committee and the Board of Directors, respectively.

According to the approval at the AGM 2014, Roche has committed itself to obtaining separate and binding shareholder approvals of the total remuneration paid to the Board of Directors and to the Corporate Executive Committee as follows:

Approval of total remuneration at the Annual General Meeting (AGM) 2019

Retrospective:

Chairman of the BoD (C):

- Bonus for financial year 2018 (total amount)

Corporate Executive Committee (CEC) including CEO Roche Group:

- Bonus for financial year 2018 (total amount)

Prospective:

Board of Directors (BoD) including C:

Aggregate total remuneration (AGM 2019–AGM 2020)

- Base pay/remuneration

Corporate Executive Committee (CEC) including CEO Roche Group:

Aggregate total remuneration (AGM 2019–AGM 2020)

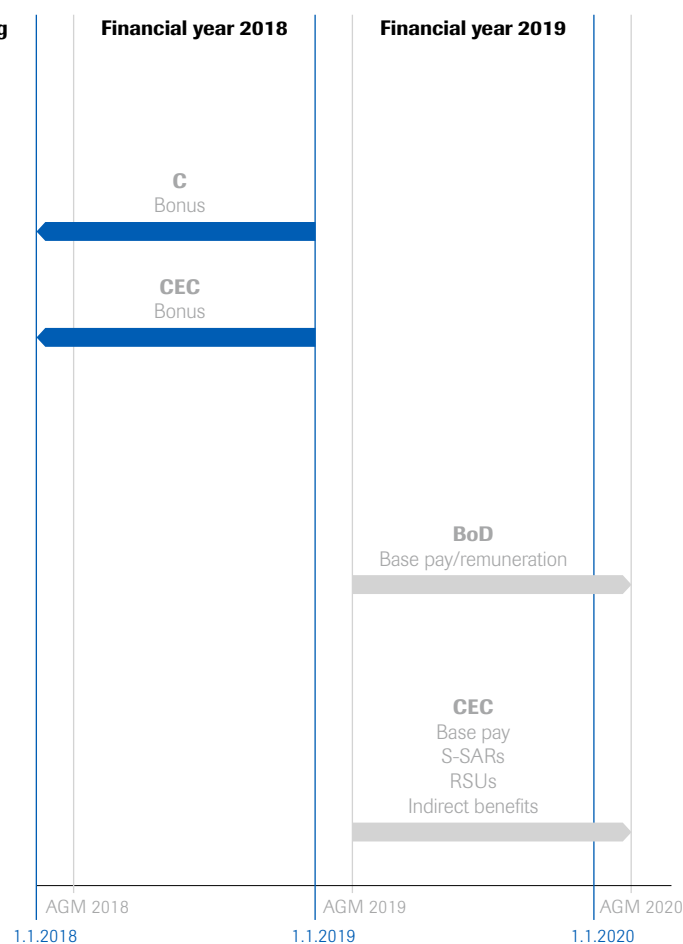
- Base pay
- Stock-settled Stock Appreciation Rights (S-SARs)
- Restricted Stock Units (RSUs) (see 3.1.6)
- Indirect benefits

Retrospective approval

Total aggregate bonus amounts for the Corporate Executive Committee and the Chairman of the Board of Directors for the financial year just ended will be submitted retrospectively at each ordinary AGM for separate and binding approval.

Prospective approval

All other Board and Executive aggregate remuneration will be submitted prospectively to the AGM for separate and binding approval for the period between two ordinary AGMs.



3. Remuneration components

3.1 Overview of remuneration elements

Remuneration to the members of the Board of Directors and the Corporate Executive Committee are composed of the following elements (for concrete composition see chart below: 'Composition of remuneration to the Board of Directors and the Corporate Executive Committee'):

The fixed base salary is complemented with the annual variable bonus as **Short-Term Incentive (STI)** and with perennial remuneration elements (S-SARs, PSP, as of 2019 see 3.1.6) as **Long-Term Incentive (LTI)**.

The remuneration components are linked to the employees' performance, the company's financial performance and commercial success and thus align the interests of Roche and its employees with those of shareholders.

The LTI remuneration components are intended to sustainably and homogeneously and long-term oriented align management's interest with those of shareholders and holders of non-voting equity securities and to give participating managers an additional incentive to achieve value growth in the form of long-term total shareholder returns.

Composition of remuneration to the Board of Directors and the Corporate Executive Committee

Annual remuneration elements	Description	C	BoD	CEO Roche Group	CEC
Base pay/ remuneration	Monthly payment (see 3.1.1 below)	√	√ Quarterly payments	√	√
Bonus	Annual payment (see 3.1.2 below)	√ For 10 years blocked non-voting equity securities and/or shares	-	√ For 10 years blocked non-voting equity securities and/or shares	√ Cash
Pensions etc.	(see 3.1.7 below)	√	-	√	√
Perennial remuneration elements					
Stock-settled Stock Appreciation Rights (S-SARs)	(see 3.1.3 below)	-	-	√	√
Performance Share Plan (PSP)	(see 3.1.4 below)	-	-	√ For 10 years blocked non-voting equity securities and/or shares	√

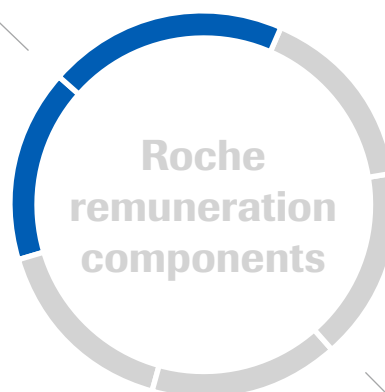
Variable, long-term

STI:

- Bonus

LTI:

- Stock-settled Stock Appreciation Rights
- Performance Share Plan



Base salary

Indirect benefits (employer contribution):

- Pensions and insurance contributions
- Roche Connect
- Tax consulting services

Expense allowances

Others:

- Children's schooling costs
- Foreign tax obligation
- AHV/IV/ALV

Fixed

3.1.1 Base pay (fixed)

Base pay (cash payment) is determined for each position based on salary market data of other leading global pharmaceutical companies (see footnote 1) and of other major Swiss companies (see footnote 2) and reflects individuals' abilities, experience and performance over time. Pay adjustments are likewise linked to individual performance and take into account prevailing market conditions and the company's overall financial situation.

The Remuneration Committee makes and reviews the final decision on the individual base pay paid to the Chairman of the Board of Directors and members of the Corporate Executive Committee and on the remuneration of the other members of the Board.

3.1.2 Bonuses (variable)

Bonuses are annually awarded for individual contributions of value creation in a business year and are meant to be an incentive to strive for outstanding results and to create new business opportunities. Bonus amounts are linked to Group and divisional core profits, sales growth at constant exchange rates, Operating Profit After Capital Charge (OPAC) based on core operating profit, core earnings per share and non-voting equity security (NES) growth at constant exchange rates, product development pipeline, diversity of employees and managers, environmental goals and to the achievement of measurable and qualitative individual or functional performance objectives. For competitive reasons, Roche does not disclose the individual performance objectives of members of its Corporate Executive Committee and of its Chairman.

In December at the end of a reporting year or in January following a reporting year, the Remuneration Committee decides on the bonuses and their amounts payable to the Chairman of the Board and the members of the Corporate Executive Committee in respect of the current reporting year, based on performance against the aforementioned objectives. At the same time, the Remuneration Committee also decides in what form bonuses will be awarded, ie, cash payments and/or non-voting equity securities and/or shares.

3.1.3 Stock-settled Stock Appreciation Rights (S-SARs) (long-term)

S-SARs entitle holders to benefit financially from any increase in the value of Roche's non-voting equity securities between the grant date and the exercise date. As of 2012, S-SARs granted all vest together after three years (as of 2019 see 3.1.6) and then have to be exercised within seven years of the grant date (as of 2019 see 3.1.6). Unexercised S-SARs lapse without compensation. Since 2012, the fair value of S-SARs has been calculated at the grant date using the trinomial model for American call options (for details see page 139).

S-SARs to the Corporate Executive Committee are allocated individually at the Remuneration Committee's discretion. In 2018 in addition, around 19,400 employees received S-SARs (for their new choice of the mix between S-SARs and RSUs as of 2019 and regarding changes in vesting and expiration periods, in the composition of the remuneration components for the Corporate Executive Committee and the Enlarged Corporate Executive Committee starting as of 2019 see 3.1.6).

3.1.4 Performance Share Plan (PSP) (long-term)

The PSP was established in 2002 for periods of three years each and is based on a three-year comparison of the Total Shareholder Return (TSR) with 15 peer companies (see footnote 1).

In a respective year, the PSP consists of three overlapping performance cycles, with a new cycle starting at the beginning of each year and a cycle finishing at the end of each year. In 2018, there were the three overlapping performance cycles PSP 2016–2018, PSP 2017–2019 and PSP 2018–2020, of which PSP 2016–2018 closed on 31 December 2018 (see 5.7 and 5.3).

The plan's key performance metric for an award, the TSR, is calculated as a three-month moving average rate before the start of and before the end of the performance cycle. The payment of the PSP is determined by the Board of Directors on an annual basis, acting upon recommendations from the Remuneration Committee.

Since 2016, PSP awards as a remuneration component has been reserved for the Corporate Executive Committee and the Enlarged Corporate Executive Committee, however, no new awards will be granted as of 2019 (see 3.1.6).

The long-term incentives for the Corporate Executive Committee comprised until 2018 PSP awards and S-SARs, approximately 50% each.

3.1.5 Restricted Stock Units (RSUs) (long-term)

RSUs serve as a remuneration component for around 19,600 eligible Roche employees. RSUs contain rights to receive non-voting equity securities and/or shares after a three-year vesting period plus a value adjustment (being the amount equivalent to the sum of the dividend paid during the vesting period attributable to the number of non-voting equity securities and/or shares for which an individual award

has been granted). They will be vested to the recipient after three years only. Thereafter, resulting non-voting equity securities and/or shares may remain blocked for up to ten years (for their new choice of the mix between S-SARs and RSUs as of 2019 and regarding changes in vesting and expiration periods, in the composition of the remuneration components for the Corporate Executive Committee and the Enlarged Corporate Executive Committee see 3.1.6).

3.1.6 Outlook 2019

Starting in 2019, subject to the approval of corresponding changes to the Articles of Incorporation at the Annual General Meeting 2019, composition of the remuneration components of the Long-Term Incentive (LTI) for the Corporate Executive Committee and the Enlarged Corporate Executive Committee will change. No new PSP awards will be granted as of the end of 2018, whereby the Board of Directors, acting upon recommendations from the Remuneration Committee, must determine the payment of the ongoing PSP 2017–2019 and PSP 2018–2020 at the end of 2019 and 2020, respectively. As of 2019, LTI of the Corporate Executive Committee and the Enlarged Corporate Executive Committee will be complemented with Restricted Stock Units (RSUs) and will be composed of 80% S-SARs and 20% RSUs (based on the already existing individual target value of the total LTI for Corporate Executive Committee members of 133.33% of a base pay measured on 1 January of a year). Vesting and expiration periods are aligned for all S-SARs and RSUs (see below). RSU awards are allocated individually for the Corporate Executive Committee and Enlarged Corporate Executive Committee at the Remuneration Committee's discretion. Unlike all other participants of the two programmes, members of the Corporate Executive Committee and the Enlarged Corporate Executive Committee have no choice in determining the mix of RSUs and S-SARs, which will have a four-year cliff vesting.

As of 2019, with the new grant in March 2019, remaining participants of the S-SARs and RSUs programmes will be offered a choice of three combinations to determine the mix of Restricted Stock Units (RSUs) and Stock-settled Stock Appreciation Rights (S-SARs, options are used instead of S-SARs in some countries). The following options will be offered:

Choice 1	Choice 2	Choice 3
80% S-SARs	50% S-SARs	20% S-SARs
20% RSUs	50% RSUs	80% RSUs

Offering this level of choice empowers participants to engage more fully in their total rewards, enables them to better understand a critical element of their compensation, increases the value of the programme, and positions Roche as the first among its peer group to provide this benefit. The expiration period for any newly issued S-SARs will be extended from currently seven years to ten years. This will give participants an additional three years to exercise vested S-SARs. The vesting schedule for any newly issued RSUs will change from three-year cliff vesting to four-year annual vesting. Each year, 25% of the granted RSUs will vest and will become available to participants.

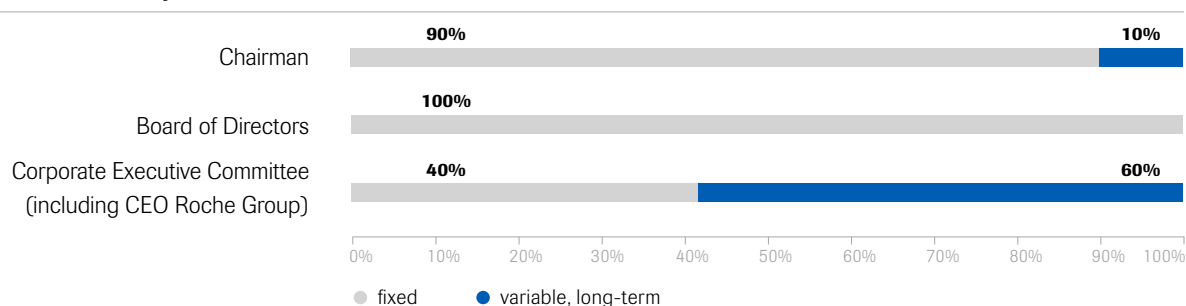
The vesting schedule for S-SARs, currently three-year annual vesting, will also be aligned with a four-year annual vesting schedule for any new grants.

These innovative changes will make the Roche Long-Term Incentive programme more attractive, enabling Roche to attract, motivate and retain the best talent and keep it aligned with the company's long-term success.

3.1.7 Indirect benefits

As shown in 5.9 (5.3 [for the CEO Roche Group] and 4.3 [for the Chairman], respectively), members of the Corporate Executive Committee additionally received indirect benefits (payments in pension funds, MGB [Stiftung der F. Hoffmann-La Roche AG für Mitarbeiter-Gewinnbeteiligung als Ergänzung der beruflichen Vorsorge, ie, employee profit-sharing foundation supplementing occupational pension benefits], insurances, Roche Connect, payments for foreign tax obligation and tax consulting services and annual expense allowances) and as shown under 5.10 individual members of the Corporate Executive Committee received payments for schooling costs for their children.

3.2 Weighting (fixed/variable, long-term) of 2018 remuneration components (at target and as percentage of total remuneration in 2018)



3.3 Ratio of the remuneration components relative to fixed base pay of the Corporate Executive Committee 2018

Ratio of variable remuneration components (bonuses, S-SARs and PSP) relative to % of value of fixed base pay

Criteria	STI (variable)	LTI (long-term)	
	Bonus	S-SARs	PSP
Individual target value*	≤100%	66.66%	66.66%**
Minimum	0%	0%	0%
Maximum	200%	66.66%	133.33%
Performance criteria	Group objectives (Group and divisional business performance) and individual objectives considering core profits, sales growth at constant exchange rates, Operating Profit After Capital Charge (OPAC) based on core operating profit, core earnings per share and non-voting equity security (NES) growth at constant exchange rates, product development pipeline, diversity of employees and managers, environmental goals	Value development determined by performance (plus a value adjustment for dividends) of NES after grant	Value development determined by performance (plus a value adjustment for dividends) of NES/shares after grant. Group performance of TSR in relation to TSR performance of peer set (TSR definition see 5.7)
Split in %			
a) Group objectives	70%	n.a.	100%
b) Individual objectives	30%	n.a.	-

n.a. – not applicable

* Assessed in consideration of the performance of competitors and the macro-economic development

** Based on annual base pay measured at 1 January of first year of cycle

For all further details please refer to the following sections of this Remuneration Report.⁵

⁵ See also in the Finance Report Note 31 to the Roche Group Consolidated Financial Statements ('Related parties', page 120) and Note 6 to the Financial Statements of Roche Holding Ltd ('Board and Executive shareholdings', page 170).

4. Remuneration of the Board of Directors

4.1 Resolution and approval

Remuneration of the Chairman of the Board of Directors and of members of the Board of Directors was decided at the Remuneration Committee's discretion, taking into account market comparisons.

The remuneration is in form of cash payments and is annually tracked against market data on directors' pay at other leading global pharmaceutical companies (see footnote 1) and other major Swiss companies (see footnote 2) which is assisted by the consultancy of PwC.

As in the previous year, in 2019, the Board of Directors will separately submit the total aggregate bonus of the Chairman of the Board of Directors to the General Meeting for the 2018 financial year for retrospectively binding approval.

The maximum amounts of the total aggregate remuneration of the Board of Directors for the period between the ordinary General Meeting 2019 and the ordinary General Meeting 2020 will be tabled in 2019 as in the previous year for the General Meeting's prospectively binding approval (see 2.2).

4.2 Amount of remuneration to the members of the Board of Directors

In 2018, the members of the Board of Directors⁶ received remuneration and additional compensation in form of quarterly fixed cash payments as shown in the 'Remuneration of members of the Board of

Directors 2018' table on page 132 for their Board activities. Roche paid legally required employer's contributions of total CHF 120,473 to Swiss social security programmes providing retirement, disability and unemployment benefits (AHV/IV/ALV) for the members of the Board of Directors beside the legally required contributions separately stated for the Chairman of the Board of Directors.

The basic remuneration of the Board of Directors (excluding the Chairman) has remained unchanged since 2001.

With the exception of the Chairman of the Board of Directors (bonus in form of blocked shares) and Dr Severin Schwan as an executive member of the Board, members of the Board of Directors were not awarded any shares, non-voting equity securities or S-SARs.

There are no loans or credits granted to the members of the Board of Directors.

In his capacity as a member of the Chugai International Council (CIC) of Chugai Pharmaceutical Co., Ltd. André Hoffmann received in 2018 honoraria amounting to a total of USD 40,000 (CHF 39,123).

For his advisory service on the Genentech Scientific Review Board, Prof. Dr Richard P. Lifton received in 2018 honoraria amounting to a total of USD 10,000 (CHF 9,781).

AUDITED

⁶ For a list of members, their positions and their committee memberships and chairmanships see page 107.

Remuneration of members of the Board of Directors 2018 (in CHF)

	Basic remuneration	Additional remuneration for committee members/chairs ⁷	Additional special remuneration	Total remuneration
Ch. Franz, Chairman		(see '4.3 Total remuneration paid to the Chairman of the Board of Directors')		
A. Hoffmann, Vice-Chairman	400,000 ⁸	–	39,123 (see page 131)	439,123
J. Bell	300,000	30,000	–	330,000
J. Brown	300,000	60,000	–	360,000
P. Bulcke	300,000	30,000	–	330,000
A. Hauser	300,000	30,000	–	330,000
R.P. Lifton	300,000	30,000	9,781 (see page 131)	339,781
A. Oeri	300,000	60,000	–	360,000
B. Poussot	300,000	30,000	–	330,000
S. Schwan	(see '5.3 Highest total remuneration paid to Dr Severin Schwan as a member of the Corporate Executive Committee', remuneration received in his primary function as CEO Roche Group is reflected in total remuneration for the Corporate Executive Committee)			
C. Suessemuth Dyckerhoff	300,000	60,000	–	360,000
P.R. Voser	300,000	30,000	–	330,000
Total⁹	3,100,000	360,000	48,904	3,508,904

AUDITED

7 With the exception of members of the Presidium (Chairman, Vice-Chairman) Board members receive CHF 30,000/year for each committee they serve on and CHF 60,000/year for each committee they chair.

8 Remuneration for serving as Vice-Chairman of the Board.

9 Additionally, employer contribution to AHV/IV/ALV totalling CHF 351,618 (including the Chairman) was paid that does not form part of remuneration.

Remuneration of members of the Board of Directors 2017 (in CHF)

	Basic remuneration	Additional remuneration for committee members/chairs ¹⁰	Additional special remuneration	Total remuneration
Ch. Franz, Chairman	(see '4.3 Total remuneration paid to the Chairman of the Board of Directors')			
A. Hoffmann, Vice-Chairman	400,000 ¹¹	–	39,392	439,392
J. Bell	300,000	30,000	–	330,000
J. Brown	300,000	60,000	–	360,000
P. Bulcke	300,000	30,000	–	330,000
A. Hauser (since March 2017)	250,000 ¹²	30,000	–	280,000
R.P. Lifton	300,000	30,000	18,465	348,465
A. Oeri	300,000	60,000	–	360,000
B. Poussot	300,000	30,000	–	330,000
S. Schwan	(see '5.3 Highest total remuneration paid to Dr Severin Schwan as a member of the Corporate Executive Committee', remuneration received in his primary function as CEO Roche Group is reflected in total remuneration for the Corporate Executive Committee)			
C. Suessmuth Dyckerhoff	300,000	60,000	–	360,000
P.R. Voser	300,000	30,000	–	330,000
P. Baschera (retired in March 2017)	75,000 ¹³	7,500 ¹³	–	82,500 ¹³
Total¹⁴	3,125,000	367,500	57,857	3,550,357

AUDITED

¹⁰ With the exception of members of the Presidium (Chairman, Vice-Chairman) Board members receive CHF 30,000/year for each committee they serve on and CHF 60,000/year for each committee they chair.

¹¹ Remuneration for serving as Vice-Chairman of the Board.

¹² Prorated remuneration for the period from March to December 2017.

¹³ Prorated remuneration paid for the period January to March 2017.

¹⁴ Additionally, employer contribution to AHV/IV/ALV totalling CHF 427,155 (including the Chairman) was paid that does not form part of remuneration.

4.3 Total remuneration paid to the Chairman of the Board of Directors

As Chairman, Dr Christoph Franz received total remuneration for 2018 as shown below. The Remuneration Committee's bonus proposal (adopted in late 2018) in respect of the 2018 financial year

(in form of shares blocked for ten years, payable in March 2019) will be put for shareholder binding vote at the 2019 ordinary Annual General Meeting (AGM).

The Chairman's total remuneration is contained in the total remuneration of the Board of Directors in 4.4.

Total remuneration paid to the Chairman of the Board of Directors (in CHF)

	2018	2017
Base salary (in cash)	3,500,000	3,500,000
Bonus (subject to approval of the Annual General Meeting)	558,390*	558,390*
Pension funds/MGB ¹⁵ /insurances/annual expense allowances	1,687,311**	1,681,401**
Total	5,745,701¹⁶	5,739,791

* In form of shares blocked for 10 years (calculation of number of shares, based on the price at the date of transfer in March 2019 and April 2018, respectively, after approval at the AGM 2019/AGM 2018, respectively), calculation of value in consideration of reduction of value due to blocking period of 10 years (reduced market value: 55.839%) to be submitted for shareholder approval at the AGM 2019/as approved at the AGM 2018, respectively

** Including employer contribution of social securities' beneficial parts

¹⁵ MGB: Stiftung der F. Hoffmann-La Roche AG für Mitarbeiter-Gewinnbeteiligung (employee profit-sharing foundation supplementing occupational pension benefits).

¹⁶ Additionally, employer contribution to AHV/IV/ALV of CHF 231,145 (2017: CHF 231,200) was paid that does not form part of remuneration.

4.4 Total remuneration paid to the Board of Directors

For the 2018 calendar year the members of the Board of Directors received remuneration including bonuses and employer contribution of social securities' beneficial parts totalling CHF 9,328,325 (2017: CHF 9,364,757), excluding additional employer's contribution paid to AHV/IV/ALV totalling CHF 351,618 (2017: CHF 427,155) that does not form part of remuneration.

4.5 Remuneration paid to the former members of the Board of Directors

Former member of the Board of Directors Dr Franz B. Humer in 2018 received fees amounting to a total of USD 40,000 (CHF 39,123) for serving as a member of the Chugai International Council (CIC) of Chugai Pharmaceutical Co., Ltd.

Former member of the Board of Directors William M. Burns in 2018 received honoraria amounting to a total of USD 40,000 (CHF 39,123) in his capacity as a member of the Chugai International Council (CIC) of Chugai Pharmaceutical Co., Ltd.

No additional remuneration was paid.

4.6 Board remuneration subject to approval at the Annual General Meeting**4.6.1 Submission of the Chairman's total aggregate bonus for a binding vote at the Annual General Meeting**

Remuneration to the Chairman of the Board of Directors includes a bonus award of CHF 558,390 in form of shares blocked for ten years as shown in the table in section '4.3 Total remuneration paid to the Chairman of the Board of Directors'. The Board of Directors will submit the Remuneration Committee's bonus proposal (adopted in late 2018) for the Chairman of the Board, Dr Christoph Franz, in respect of the 2018 financial year (payable in March 2019, excluding legally required employer's contributions to AHV/IV/ALV) for the shareholder binding vote to the 2019 ordinary Annual General Meeting.

Retrospective approvals of the Chairman's total aggregate bonus (in CHF)*

	Proposal AGM 2019	AGM 2018	AGM 2017
	Aggregate amount for financial year 2018	Aggregate amount for financial year 2017	Aggregate amount for financial year 2016
Total aggregate amount proposal for approval/ approved by the AGM	558,390**	558,390**	558,390**

* Excluding legally required employer's contributions to AHV/IV/ALV

** Bonus award (in form of shares, blocked for 10 years [calculation of number of shares based on the price at the date of transfer in March 2019/ April 2018/April 2017, respectively, after approval at the AGM 2019/AGM 2018/AGM 2017, respectively], calculation of value in consideration of reduction of value due to blocking period of 10 years [reduced market value: 55.839%] to be submitted for shareholder approval at the AGM 2019/ as approved at the AGM 2018 and AGM 2017, respectively)

4.6.2 Submission of the Board's total aggregate future remuneration for a binding shareholder vote

The Board of Directors proposes that the 2019 ordinary AGM approve Board remuneration totalling not more than CHF 10,000,000 (excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses) for the period ending at the 2020 ordinary AGM.

Dr Severin Schwan's remuneration as shown in 5.3 which he receives in his function as CEO Roche Group and member of the Corporate Executive Committee is not included here but is part of the Corporate Executive Committee's total remuneration.

Prospective approvals of the Board's total aggregate future remuneration (in CHF)*

	Proposal AGM 2019	AGM 2018	AGM 2017
	Aggregate amount for the period AGM 2019-AGM 2020	Aggregate amount for the period AGM 2018-AGM 2019	Aggregate amount for the period AGM 2017-AGM 2018
Total aggregate amount proposal for approval/ approved by the AGM	10,000,000	10,000,000	10,000,000

* Excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses

4.6.3 Reconciliation of the reported remuneration with the shareholders' approved remuneration for the members of the Board of Directors

The 2017 ordinary AGM approved Board remuneration totalling not more than CHF 10,000,000 (excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses) for the period ending at the 2018 ordinary AGM.

For comparison, from the 2017 ordinary AGM to the 2018 ordinary AGM actual remuneration amounted to CHF 8,700,243 (excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses).

Prospectively approved total remuneration for the members of the Board of Directors in comparison to the actual total payments made (in CHF)*

	Total remuneration for the period AGM 2018–AGM 2019	Total remuneration for the period AGM 2017–AGM 2018	Total remuneration for the period AGM 2016–AGM 2017
Maximum of total remuneration approved by the AGM	10,000,000	10,000,000	10,000,000
Actual total remuneration paid	Calculation at end of period	8,700,243	8,637,246
Within the approved limit	Calculation at end of period	Yes	Yes

* Excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses

4.7 Security holdings

Directors André Hoffmann and Dr Andreas Oeri and members of the founders' families who are closely associated with them belong to a contractually bound shareholder group with pooled voting rights. At the end of 2018 this group held 72,018,000 shares (45.01% of issued shares). Detailed information about this group can be found in the Finance Report, Note 31 to the Roche Group Consolidated Financial Statements

(‘Related parties’, page 120) and in Note 4 to the Financial Statements of Roche Holding Ltd (‘Significant shareholders’, page 169). In addition, as at 31 December 2018 (as at 31 December 2017, respectively) the members of the Board of Directors and persons closely associated with them held Roche shares, non-voting equity securities (NES) and American Depositary Receipts (ADRs***) as shown in the table ‘Security holdings’ below.

Security holdings (shares and NES)

	(as at 31 December 2018)				(as at 31 December 2017)			
	Shares (number)	Non-voting equity securities (NES) (number)	Close relatives' security holdings (number/type)	Others (number)	Shares (number)	Non-voting equity securities (NES) (number)	Close relatives' security holdings (number/type)	Others (number)
Board of Directors								
Ch. Franz	16,014	4,810	–	–	11,522	4,810	–	–
A. Hoffmann	–*	200	–	–	–*	200	–	–
J. Bell	1,115	1,647	–	–	1,115	1,647	–	–
J. Brown	729	–	–	–	729	–	–	–
P. Bulcke	–	4,000	–	–	–	4,000	–	–
A. Hauser	–	150	20 NES	–	–	150	20 NES	–
R.P. Lifton	–	–	–	300 ADRs***	–	–	–	300 ADRs***
A. Oeri	–*	187,793	–	–	–*	187,793	–	–
B. Poussot	500	500	–	–	500	500	–	–
S. Schwan	(see ‘5.16 Security holdings’ Corporate Executive Committee on page 145)				(see ‘5.16 Security holdings’ Corporate Executive Committee on page 145)			
C. Suesmuth Dyckerhoff	–	2,100**	–	–	–	621**	–	–
P.R. Voser	–	5,000	–	–	–	5,000	–	–
Total	18,358	206,200	20 NES	300 ADRs***	13,866	204,721	20 NES	300 ADRs***

* Shares held by the shareholder group with pooled voting rights not listed

** Jointly held with close relative

*** Roche's ADR (American Depositary Receipt), listed on OTCQX www.otcmart.com/stock/RHHBY/quote International Premier under the symbol RHHBY, ISIN US771195104. Traded in USD, eight (8) ADRs represent one (1) underlying NES.

5. Remuneration of the Corporate Executive Committee

5.1 Resolution and approval

Remuneration of the members of the Corporate Executive Committee was decided at the Remuneration Committee's discretion, taking into account market comparisons.

As in the previous year, in 2019, the Board of Directors will separately submit the total aggregate bonuses of the Corporate Executive Committee to the General Meeting for the 2018 financial year for retrospectively binding approval.

The maximum amounts of the total aggregate remuneration of the Corporate Executive Committee for the period between the ordinary General Meeting 2019 and the ordinary General Meeting 2020 will be tabled in 2019 as in the previous year for the General Meeting's prospectively binding approval (see 2.2).

5.2 Amount of remuneration to members of the Corporate Executive Committee

The general provisions assigning authority for decisions on Corporate Executive Committee remuneration to the Remuneration Committee and to the Board of Directors are outlined on page 123, '2. Remuneration decision process and approval framework'.

In 2018, members of the Corporate Executive Committee received remuneration for their work as shown in 5.3–5.12. The amount of remuneration for the CEO Roche Group, Dr Severin Schwan, is explained in 5.3 in detail.

Payments (base pay, bonus, S-SARs, RSUs, indirect benefits such as employer contributions for pension funds, MGB, Roche Connect, expense allowances etc.) to Dr Michael Heuer, who was appointed as CEO Roche Diagnostics a. i. as of October 2018, are included and aggregated in the total remuneration of the Corporate Executive Committee (see 5.12).

5.3 Highest total remuneration paid to Dr Severin Schwan as a member of the Corporate Executive Committee

Dr Severin Schwan, executive member of the Board of Directors, received his remuneration in his primary function as CEO Roche Group. It is reflected as the highest total remuneration paid to a member of the Corporate Executive Committee (see page 138) and included in the total amount paid to the Corporate Executive Committee (see '5.12 Total remuneration paid to the members of the Corporate Executive Committee', page 142).

Highest total remuneration paid to Dr Severin Schwan as a member of the Corporate Executive Committee (in CHF)

	2018	2017 ¹⁷
Base salary	4,000,000	4,000,000
S-SARs ¹⁸	2,666,934	2,666,851
Pension funds/MGB ¹⁹ /insurances	585,418**	578,506**
Roche Connect	100,008	100,008
Bonus (subject to approval of the total aggregate bonuses for the Corporate Executive Committee by Annual General Meeting)		
– Blocked shares	2,791,950 ^{20*}	2,791,950*
PSP	1,488,911 ^{21*}	1,488,970 ^{22*}
Other payments incl. expense allowance/for tax consulting services	127,314	62,778
Total	11,760,535²³	11,689,063²³

AUDITED

- * Calculation of value of non-voting equity securities/shares in consideration of reduction of value due to blocking period of 10 years (reduced market value: 55.839%)
- ** Including employer contribution of social securities' beneficial parts
- 17 For detailed calculation of the remuneration for 2017 and 2016 see Annual Report 2017, page 137.
- 18 Number of S-SARs 2018: 100,677, grant value according to the trinomial model for American call options: CHF 26.49. Trinomial model for American call options value as described in '5.6 Stock-settled Stock Appreciation Rights (S-SARs) of the other members of the Corporate Executive Committee', page 139.
Number of S-SARs 2017: 85,476, grant value according to the trinomial model for American call options: CHF 31.20. Trinomial model for American call options value as described in '5.6 Stock-settled Stock Appreciation Rights (S-SARs) of the other members of the Corporate Executive Committee', page 139.
- 19 MGB: Stiftung der F. Hoffmann-La Roche AG für Mitarbeiter-Gewinnbeteiligung (employee profit-sharing foundation supplementing occupational pension benefits).
- 20 Shares blocked for 10 years (calculation of number of shares based on the share price at the date of transfer in March 2019 after approval at the AGM 2019).
- 21 Target number of non-voting equity securities for PSP 2018–2020 (11,076 non-voting equity securities) multiplied per non-voting equity securities' price averaged over the three months (October to December 2017) prior to the start of the performance cycle 2018–2020, CHF 240.74/non-voting equity security.
- 22 Target number of non-voting equity securities for PSP 2017–2019 (11,565 non-voting equity securities) multiplied per non-voting equity securities' price averaged over the three months (October to December 2016) prior to the start of the performance cycle 2017–2019, CHF 230.57/non-voting equity security.
- 23 Includes an annual expense allowance (CHF 30,000), payments for tax consulting services (CHF 47,314; 2017: CHF 32,778) and anniversary payment (CHF 50,000). Additionally, employer contribution to AHV/IV/ALV of CHF 428,867 (2017: CHF 555,967) was paid that does not form part of remuneration.

5.4 Base pay of the other members of the Corporate Executive Committee**Base pay** (in CHF)

	2018	2017
R. Diggelmann (retired from the Corporate Executive Committee at the end of September 2018)	975,000*	1,300,000
A. Hippe	1,600,000	1,600,000
G.A. Keller	1,500,000	1,500,000
D. O'Day	2,500,000	2,500,000
C.A. Wilbur	925,000	825,000
Total	7,500,000	7,725,000

AUDITED

- * Prorated remuneration for the period from January to September 2018.

Base pay to Dr Michael Heuer is included and aggregated in the total remuneration of the Corporate Executive Committee (see 5.12).

5.5 Bonuses of the other members of the Corporate Executive Committee

The Remuneration Committee of the Board of Directors determined the Corporate Executive Committee members' bonuses based on the performance 2018 against the agreed objectives. For Dr Michael Heuer a regular bonus of CHF 500,000 and a bonus for his interim function of an additional CHF 500,000 (total: CHF 1 million) is being proposed. It is included and aggregated in the total remuneration of the Corporate

Executive Committee (see 5.12). The total aggregate amount of bonuses will be brought forward for a binding vote by the Annual General Meeting 2019.

Except for Dr Severin Schwan, all members of the Corporate Executive Committee will receive the bonus 2018 as a 100% cash payment which is due in March 2019. Dr Severin Schwan will receive the bonus in form of Roche shares which are blocked for ten years (see page 138). Bonus payment is due in March 2019.

Bonus (in CHF)

	2018 (subject to approval of the total aggregate bonuses of the Corporate Executive Committee by the Annual General Meeting 2019)	2017
R. Diggelmann (retired from the Corporate Executive Committee at the end of September 2018)	900,000	1,350,000
A. Hippe	2,000,000	2,000,000
G.A. Keller	1,400,000	1,400,000
D. O'Day	–	3,100,000
C.A. Wilbur	1,200,000	950,000
Total	5,500,000	8,800,000

AUDITED

5.6 Stock-settled Stock Appreciation Rights (S-SARs) of the other members of the Corporate Executive Committee

The S-SARs shown in the 5.16.2 'S-SARs' table on page 146 entitle holders to benefit financially from any increase in the value of Roche's non-voting equity securities (NES) between the grant date and the exercise date. The strike price for S-SARs under the terms of this multi-year plan was the closing price for Roche NES at grant date. All S-SARs vest three years after the grant date. Vested S-SARs can be exercised (converted into NES) within seven years of the grant date. Unexercised S-SARs lapse without compensation.

The fair value of the S-SARs is calculated at the grant date using the trinomial model for American call

options. The trinomial model is an effective method for valuation of American call options, as it considers the possibility of exercising the option any time prior to maturity (called 'American' option, as compared to a 'European' option, which only allows exercise at their maturity date).²⁴

The numbers of S-SARs, the strike prices, expiry dates and grant values for S-SARs are shown in the 5.16.2 'S-SARs' table on page 146. The numbers of S-SARs as calculated at the time of issue have been entered as values in the table on pages 140 and 138.²⁵ S-SARs granted to Dr Michael Heuer are subject to a yearly vesting and shown in the 5.16.2 'S-SARs' table and the fair value for 2018 is included and aggregated in the total remuneration of the Corporate Executive Committee (see 5.12).

²⁴ For further information on the trinomial model for American call options: Please refer to Boyle, Phelim P.: 'A lattice framework for options pricing with two state variables', The Journal of Financial and Quantitative Analysis, Volume 23, Issue 1 (Mar 1988), 1–12, roche.com/trinomial-model.pdf

²⁵ See strike prices in table 5.16.2 'S-SARs', page 146.

Stock-settled Stock Appreciation Rights (S-SARs) (in CHF)		
	S-SARs 2018	S-SARs 2017
R. Diggelmann (retired from the Corporate Executive Committee at the end of September 2018)	866,700*	866,923
A. Hippe	1,066,885	1,066,759
G.A. Keller	1,000,209	1,000,022
D. O'Day	1,666,724	1,666,829
C.A. Wilbur	566,939	500,198
Total	5,167,457	5,100,731

* Grant 2018: 32,718 S-SARs, grant value CHF 26.49 per S-SAR, price CHF 220.80, expiry date 15.3.2025

5.7 Performance Share Plan (PSP) of the other members of the Corporate Executive Committee

The PSP consists of overlapping three-year performance cycles, with a new cycle beginning each year. In 2018, there were thus three cycles in progress (PSP 2016–2018, PSP 2017–2019 and PSP 2018–2020), whereas PSP 2016–2018 closed on 31 December 2018 with none of the targeted shares awarded.

Under the provisions of this plan, a number of non-voting equity securities (NES) or shares have been reserved for the participants in each cycle. The number of securities actually awarded will depend on whether and to what extent an investment in Roche securities (shares and NES) outperforms the average return on an investment in securities issued by a set of peer companies.²⁶ Comparisons are based on the securities' market prices and dividend yields, ie, on Total Shareholder Return (TSR). To reduce the effect of short-term market fluctuations, security prices are averaged over the three months (October to December) prior to the start of a performance cycle and over the three months (October to December) at the end of the cycle.

If Roche securities perform better than the average of the peer set, the Board of Directors can elect to increase the NES or shares award. The maximum award is double the original-level reserved target number of NES or shares according to the PSP (plus a value adjustment being the amount equivalent to

the sum of the dividend paid during the vesting period attributable to the number of non-voting equity securities or shares for which an individual award has been granted) and requires that Roche securities perform as well as or better than those of 75% of the peer set. In the event that an investment in Roche securities underperforms the average return delivered by the peer companies, fewer or no NES or shares will be awarded.

In 2018, NES were reserved under the plan for members of the Corporate Executive Committee as shown in the table on page 141 and on page 138. The Board of Directors will decide on the actual level of NES, shares or cash equivalent awards for the PSP cycles 2017–2019 and 2018–2020 after the close of the 2019 and 2020 financial years, respectively. The aim of the PSP is to provide an incentive to participants to achieve long-term value growth. Due to Roland Diggelmann's and Daniel O'Day's resignations, potential awards will be reduced.

Dr Michael Heuer is not participating in the PSP programme.

At the end of the PSP 2016–2018 cycle (based on a three-month average) with distributed dividends totalling CHF 21.219 billion (2018: CHF 7.159 billion; 2017: CHF 7.073 billion; 2016: CHF 6.987 billion), according to the terms of the plan, the participants received none of the originally targeted shares.

²⁶ See footnote 1, page 123.

Performance Share Plan (PSP)

	2018			2017		
	Target number of non-voting equity securities (NES) for PSP 2018-2020 (number)	Fair value at grant per non-voting equity security (NES), NES prices averaged over the three months (October to December 2017) prior to the start of the performance cycle PSP 2018-2020 (value in CHF)	Fair value of target number of non-voting equity securities (NES) for PSP 2018-2020 (value in CHF)	Target number of non-voting equity securities (NES) for PSP 2017-2019 (number)	Fair value at grant per non-voting equity security (NES), NES prices averaged over the three months (October to December 2016) prior to the start of the performance cycle PSP 2017-2019 (value in CHF)	Fair value of target number of non-voting equity securities (NES) for PSP 2017-2019 (value in CHF)
R. Diggelmann***	3,600	240.74	866,664	3,758	230.57	866,482
A. Hippe	4,430	240.74	595,511**	4,626	230.57	844,857*
G.A. Keller	4,153	240.74	558,274**	4,337	230.57	558,380**
D. O'Day	6,923	240.74	1,666,643	7,228	230.57	1,666,560
C.A. Wilbur	2,353	240.74	566,461	2,168	230.57	499,876
Total	21,459	240.74	4,253,553	22,117	230.57	4,436,155

AUDITED

* Calculation of value of non-voting equity securities in consideration of reduction of value due to blocking period of 4 years (reduced market value: 79.209%)

** Calculation of value of non-voting equity securities in consideration of reduction of value due to blocking period of 10 years (reduced market value: 55.839%)

*** Retired from the Corporate Executive Committee at the end of September 2018

5.8 Restricted Stock Units of the other members of the Corporate Executive Committee

In 2018, as the only member of the Corporate Executive Committee Dr Michael Heuer received RSUs before his appointment as CEO Roche Diagnostics a. i. (see 3.1.5).

Roche Connect is a voluntary stock purchase plan offering employees the opportunity to buy Roche non-voting equity securities (NES) up to an amount equal to 10% of their annual salary at a 20% discount. NES purchased under this plan are subject to a holding period, which is four years in Switzerland.

5.9 Indirect benefits of the other members of the Corporate Executive Committee

Employer contributions made in 2018 to social security schemes, pension plans and a Group-wide employee stock purchase plan (Roche Connect) in respect of members of the Corporate Executive Committee are shown in the 'Indirect benefits (employer contributions)' table on page 142 and employer contributions as shown in the table on page 138.

In addition, members of the Corporate Executive Committee received annual expense allowances and some members payments for foreign tax obligations and tax consulting services as shown in the table on page 142.

Indirect benefits (employer contributions) (in CHF)

	2018				2017			
	Pension funds/ MGB ²⁷ / insurances*	Annual expense allowances	Roche Connect	Payments for tax/tax consulting services	Pension funds/ MGB ²⁷ / insurances*	Annual expense allowances	Roche Connect	Payments for tax/tax consulting services
R. Diggelmann**	255,159	22,500	20,000	7,108	328,506	30,000	30,000	8,611
A. Hippe	335,418	30,000	39,996	13,378	328,506	30,000	39,996	15,545
G.A. Keller	122,226	30,000	37,500	-	115,314	30,000	37,500	1,623
D. O'Day	335,418	30,000	62,496	670,831	328,506	30,000	62,496	628,039
C.A. Wilbur	335,418	30,000	18,744	75,299	319,506	30,000	18,744	37,147
Total	1,383,639	142,500	178,736	766,616	1,420,338	150,000	188,736	690,965

* Including employer contribution of social securities' beneficial parts

** Retired from the Corporate Executive Committee at the end of September 2018

27 MGB: Stiftung der F. Hoffmann-La Roche AG für Mitarbeiter-Gewinnbeteiligung (employee profit-sharing foundation supplementing occupational pension benefits).

Payments (employer contributions) of indirect benefits for pension funds, MGB, Roche Connect, expense allowances etc. to Dr Michael Heuer are included and aggregated in the total remuneration of the Corporate Executive Committee (see 5.12).

5.10 Other remuneration and loans of members of the Corporate Executive Committee

Based on contractual obligations, in 2018, Roche paid to individual members of the Corporate Executive Committee for their children's schooling costs totalling CHF 46,777 (2017: CHF 42,300).

All aforementioned additional payments are included in the total remuneration to members of the Corporate Executive Committee.

In 2018, there are no loans or credits granted to the members of the Corporate Executive Committee.

The maximum regular period of notice for members of the Corporate Executive Committee is 12 months. There are no change-of-control clauses in the employment contracts.

5.11 Remuneration to former members of the Corporate Executive Committee

In 2018, pensions totalling CHF 2,057,784 (2017: CHF 2,049,180) were paid to former Corporate Executive Committee members.

5.12 Total remuneration paid to the members of the Corporate Executive Committee

For the 2018 calendar year, the members of the Corporate Executive Committee received remuneration including bonuses and employer contribution of social securities' beneficial parts and all payments to Dr Michael Heuer, CEO Roche Diagnostics a. i., totalling CHF 39,272,132 (2017: CHF 40,243,288), excluding additional employer's contribution paid to AHV/IV/ALV totalling CHF 1,792,838 (2017: CHF 1,975,317) that does not form part of remuneration.

No additional remuneration other than the above mentioned payments was paid to current or former members of the Corporate Executive Committee.

5.13 Executive remuneration subject to approval at the Annual General Meeting

5.13.1 Submission of Executive total aggregate bonuses for a binding vote at the Annual General Meeting

The Board of Directors proposes awarding the members of the Corporate Executive Committee bonuses (for Dr Severin Schwan in form of Roche shares which are

blocked for ten years, for all other members of the Corporate Executive Committee as a 100% cash payment, see 5.5) totalling CHF 9,291,950 in respect of the 2018 financial year (2017: CHF 11,591,950), excluding legally required employer's contributions to AHV/IV/ALV, and will submit this proposed total amount to the ordinary Annual General Meeting (AGM) 2019 for a binding vote.

Retrospective approvals of the members of the Executive Committee's total aggregate bonuses (in CHF)*

	Proposal AGM 2019	AGM 2018	AGM 2017
	Aggregate amount for financial year 2018	Aggregate amount for financial year 2017	Aggregate amount for financial year 2016
Total aggregate amount proposal for approval/ approved by the AGM	9,291,950	11,591,950	11,891,950

* Excluding legally required employer's contributions to AHV/IV/ALV

5.13.2 Submission of Executive total future aggregate remuneration for a binding shareholder vote

The Board of Directors proposes that the 2019 ordinary AGM approves remuneration for the Corporate Executive Committee totalling not more than CHF 38,000,000 (excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses) for the period ending at the 2020 ordinary AGM.

The amount of Executive total future aggregate remuneration is composed of base pay, long-term

incentives S-SARs (calculated at grant value without considering reductions of value due to blocking periods if applicable) and RSUs (see 3.1.6, calculated at the time of reservation of non-voting equity securities or shares, without considering reductions of value due to blocking periods), contributions to pension benefits (excluding legally required employer's contributions to AHV/IV/ALV) as well as contributions for expenses, payments for foreign tax obligations, tax consulting services and Roche Connect.

Prospective approvals of the members of the Executive Committee's total future aggregate remuneration (in CHF)*

	Proposal AGM 2019	AGM 2018	AGM 2017
	Aggregate amount for the period AGM 2019–AGM 2020	Aggregate amount for the period AGM 2018–AGM 2019	Aggregate amount for the period AGM 2017–AGM 2018
Total aggregate amount proposal for approval/ approved by the AGM	38,000,000	41,000,000	41,000,000

* Excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses

5.13.3 Reconciliation of the reported remuneration with the shareholders' prospectively approved remuneration for the members of the Corporate Executive Committee

The 2017 ordinary AGM approved remuneration for the Corporate Executive Committee totalling not more than CHF 41,000,000 (excluding legally required employer's contributions to AHV/IV/ALV and

excluding bonuses) for the period ending at the 2018 ordinary AGM.

For comparison, from the 2017 ordinary AGM to the 2018 ordinary AGM remuneration amounted to CHF 38,215,056 (excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses. PSP: assumption of maximum value).

Prospectively approved total remuneration of the members of the Executive Committee in comparison to actual total remuneration effected (in CHF)*

	Amount for the period AGM 2018-AGM 2019	Amount for the period AGM 2017-AGM 2018	Amount for the period AGM 2016-AGM 2017
Maximum of total remuneration prospectively approved by the AGM**	41,000,000	41,000,000	41,000,000
Total remuneration calculated at end of corresponding AGM-AGM period**	Calculation at the end of period AGM 2018-AGM 2019	38,215,056	40,001,760
Actual total remuneration realised (for corresponding AGM-AGM period based on the actual amount calculated retrospectively after the end of the corresponding PSP cycle)	Calculation at the end of 2020 (after the end of the PSP cycle 2018-2020)	Calculation at the end of 2019 (after the end of the PSP cycle 2017-2019)	24,022,793***
Within the approved limit	Calculation at end of period	Calculation at end of period	Yes
Additional amount paid for new members of the Corporate Executive Committee after approval by the AGM and not within the approved total amount	No	No	No

* Excluding legally required employer's contributions to AHV/IV/ALV and excluding bonuses

** Including assumption amount of 200% (maximum possible award) of shares/non-voting equity securities of the corresponding PSP cycle

*** Due to no award of shares under the PSP 2016-2018 cycle and their originally included calculation of 200% (maximum possible award), the amount of the total remuneration for the period AGM 2016-AGM 2017 is reduced to CHF 24,022,793.

5.14 Clawback

In addition to applicable statutory provisions, Roche's long-term incentive plans include the option to partially reclaim distributed compensation as a result of special circumstances (clawback).

If the employee voluntarily serves notice of termination of employment, S-SARs (see 5.16.2) and RSUs (see 3.1.5) which are unvested at the date of termination of employment lapse immediately without any compensation.

Upon termination of employment as a result of serious misconduct, all S-SARs and RSUs granted and outstanding, whether vested or unvested, shall lapse immediately without any compensation. According to the S-SARs plan rules, serious misconduct by the participant may include (inter alia):

- activity leading to serious disciplinary action
- repeated or willful failure to perform such duties as have been reasonably assigned by Roche
- violation of any law or public regulation
- commission of a crime
- gross negligence or willful misconduct in employment
- engaging in conduct bringing disgrace or disrepute to Roche and/or any of its subsidiaries
- violation of any of Roche's directives and guidelines relating to business conduct

According to the regulations of the PSP programme, the originally targeted but not awarded NES or shares shall lapse without any compensation upon notice of termination of employment being given for any reason other than redundancy, disability or retirement.

5.15 Guidelines for security holdings

In 2012, the Board of Directors decided that the CEO Roche Group and other CEC members must acquire shares and/or NES equivalent to two annual base salaries (CEO Roche Group since 2018 equivalent to five annual base salaries) and one annual base salary, respectively, by the end of 2016 and retain these holdings for as long as they serve on the CEC. With the exception of Cristina A. Wilbur, who joined the Corporate Executive Committee in 2016 and who must fulfil the requirement by the end of 2020, all other members of the Corporate Executive Committee fulfil this requirement.

5.16 Security holdings

As at 31 December 2018 (as at 31 December 2017, respectively) the members of the CEC and persons closely associated with them held securities as shown in the tables 'Shares and non-voting equity securities (NES)' and 'S-SARs' below.

	Type of security	Value to be acquired
CEO Roche Group	Shares and/or NES	5 × annual base salary
Members of the Corporate Executive Committee	Shares and/or NES	1 × annual base salary

5.16.1 Shares and non-voting equity securities (NES)

	(as at 31 December 2018)				(as at 31 December 2017)		
	Shares (number)	NES (number)	Close relatives' security holdings (number/type)		Shares (number)	NES (number)	Close relatives' security holdings (number/type)
			Shares	NES			
Corporate Executive Committee							
S. Schwan	175,890	35,270	-	-	153,428	27,040	-
A. Hippe	6,970	19,956	-	-	6,970	16,585	-
G.A. Keller	19,191	21,462	1,100	-	19,191	18,445	1,100
D. O'Day	3,065	19,432	-	-	3,065	16,091	-
C.A. Wilbur	-	3,955	-	-	-	3,141	-
M. Heuer	3	18,602*	-	729	n.a.	n.a.	n.a.
Total	205,119	118,677	1,100	729	182,654	81,302	1,100

n.a. - not applicable

* Excluding 4,897 RSUs

5.16.2 S-SARs

	Number of S-SARs held on 31 December 2018					
	2018	2017	2016	2015	2014	2013
Corporate Executive Committee						
S. Schwan	100,677	85,476	89,517	59,997	54,453	30,000
A. Hippe	40,275	34,191	35,811	24,003	21,783	-
G.A. Keller	37,758	32,052	33,570	22,503	20,424	-
D. O'Day	62,919	53,424	55,950	30,000	27,231	-
C.A. Wilbur	21,402	16,032	15,339	4,164	5,754	4,594
M. Heuer**	15,402	12,381	12,840	9,120	8,076	10,392
Total	278,433	233,556	243,027	149,787	137,721	44,986
Price (CHF)	220.80	251.90	251.50	256.10	263.20	214.00
Market price per NES on 31 December 2018 (CHF)	243.40					
Expiry date	15.3.2025	16.3.2024	3.3.2023	5.3.2022	6.3.2021	7.3.2020
Grant value per S-SAR (CHF)	26.49	31.20*	29.79*	43.34*	47.75*	36.38*
Since 1.1.2012: - Trinomial model for American call options						
* Values according to corresponding annual reports						
** Excluding close-relative's 460 S-SARs (2012: price: CHF 157.50; expiry date: 8.3.2019; grant value per S-SAR: CHF 24.41) holdings in total						



Statutory Auditor's Report

To the General Meeting of Roche Holding Ltd, Basel

We have audited the accompanying Remuneration Report of Roche Holding Ltd for the year ended 31 December 2018. The audit was limited to the information according to articles 14–16 of the Ordinance against Excessive Compensation in Stock Exchange Listed Companies (the Ordinance) contained in the sections marked as 'audited' with a grey line, including the respective footnotes, on pages 120 to 146 of the Remuneration Report.

Responsibility of the Board of Directors

The Board of Directors is responsible for the preparation and overall fair presentation of the Remuneration Report in accordance with Swiss law and the Ordinance. The Board of Directors is also responsible for designing the remuneration system and defining individual remuneration packages.

Auditor's Responsibility

Our responsibility is to express an opinion on the accompanying Remuneration Report. We conducted our audit in accordance with Swiss Auditing Standards. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the Remuneration Report complies with Swiss law and articles 14–16 of the Ordinance.

KPMG AG

Mark Baillache
Licensed Audit Expert
Auditor in Charge

Basel, 28 January 2019

An audit involves performing procedures to obtain audit evidence on the disclosures made in the Remuneration Report with regard to compensation, loans and credits in accordance with articles 14–16 of the Ordinance. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatements in the Remuneration Report, whether due to fraud or error. This audit also includes evaluating the reasonableness of the methods applied to value components of remuneration, as well as assessing the overall presentation of the Remuneration Report.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Opinion

In our opinion, the Remuneration Report for the year ended 31 December 2018 of Roche Holding Ltd complies with Swiss law and articles 14–16 of the Ordinance.

Marc Ziegler
Licensed Audit Expert



Independent Assurance Report on the Roche Sustainability Reporting 2018

To the Corporate Governance and Sustainability Committee of Roche Holding AG, Basel.

We have been engaged to perform assurance procedures to provide limited assurance on the aspects of the 2018 Sustainability Reporting of Roche Holding AG, Basel and its consolidated subsidiaries ('Roche') included in the Annual Report 2018 ('Report').

Scope and Subject matter

Our limited assurance engagement focused on the following data and information disclosed in the Sustainability Reporting of Roche for the year ended on December 31, 2018:

- the management of reporting processes with respect to the Sustainability Reporting in all material aspects and the preparation of Safety, Security, Health and Environmental protection ('SHE'), contributions, people key figures as well as the related control environment in relation to the data aggregation of these key figures;
- the materiality determination process of Roche at group level according to the requirements of the 'GRI Standards' and as disclosed on page 5 of the Report;
- the design of the sustainability risks and opportunities determination process based on Roche corporate-level activities, disclosed on page 4 in the paragraph 'Risk management' of the Report;
- the people key figures disclosed on pages 72 to 75 of the Report and the SHE key figures (including greenhouse gas emissions for scope 1 & 2 and scope 3 resulting from business travel, compressed air, liquid nitrogen and waste) in the tables and graphs on pages 80 to 87 and page 98 of the Report; and
- the figures on the Roche Group level in relation to the contributions and donations, disclosed on page 101 of the Report.

We have not carried out any work on data reported for prior reporting periods, nor have we performed work in respect of projections and targets.

Criteria

The management reporting processes with respect to the Sustainability Reporting and key figures were prepared by Roche based on the internal policies and procedures as set forth in the following:

- the Roche Group internal Sustainability Reporting guidelines based on the 'Responsible Care Health, Safety and Environmental Protection reporting guidelines' published by the European

- Chemical Industry Council CEFIC and the 'GRI Standards' published in October 2016 by the Global Reporting Initiative (GRI);
- the Roche Group internal Corporate Reporting Manual, 'Sustainability Reporting Guidance—Economic Performance' issued June 28, 2018;
- the Roche materiality determination process at corporate level based on the 'GRI Standards' published in October 2016 by the Global Reporting Initiative (GRI); and
- the defined guidelines, by which SHE, people and contributions key figures, and sustainability risks and opportunities are internally gathered, collated and aggregated.

Inherent Limitations

The accuracy and completeness of sustainability 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 Roche's internal guidelines, definitions and procedures on the reporting of its sustainability performance.

Roche's Responsibilities

The Roche Corporate Governance and Sustainability Committee is responsible for both the subject matter and the criteria as well as for the selection, preparation and presentation of the selected information in accordance with the criteria. This responsibility includes the design, implementation and maintenance of related internal control relevant to this reporting process that is free from material misstatement, whether due to fraud or error.

Our Responsibility

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 identified sustainability information selected and contained in this report is 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', and, in respect of greenhouse gas emissions, with the International Standard on Assurance Engagements (ISAE 3410) 'Assurance Engagements on Greenhouse Gas Statements', issued by the International Auditing and Assurance Standards Board. These standards require that we plan and perform the assurance engagement to obtain limited assurance on the

identified sustainability information prepared, in all material aspects, in accordance with Roche's internal policies and procedures.

A limited assurance engagement under ISAE 3000 (revised) and ISAE 3410 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. The procedures selected depend on the assurance practitioner's judgement.

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 behaviour.

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

Our assurance procedures included, amongst others, the following work:

- *Review of the application of Roche Group guidelines*
Reviewing the application of the Roche Group internal corporate sustainability and contributions guidelines;
- *Site visits and management inquiry*
Visiting selected sites of Roche's Pharmaceuticals and Diagnostics divisions in the USA, Germany, Greece, Colombia and Italy. The selection was based on quantitative and qualitative criteria; Interviewing personnel responsible for internal sustainability reporting and data collection at the sites we visited and at the Roche Group level to determine the understanding and application of Roche's internal sustainability guidelines;
- *Assessment of the key figures*
Performing tests on a sample basis of evidence supporting selected SHE, contributions and people key figures (e.g. Roche accident rate, energy consumption, greenhouse gas emissions related to energy consumption, water, waste, contributions to public policy stakeholders, representation of women in key leadership roles) concerning completeness, accuracy, adequacy and consistency;
- *Review of documentation and analysis of relevant policies and principles*

Reviewing relevant documentation on a sample basis, including Roche Group sustainability policies, management of reporting structures and documentation;

Reviewing the principles of the Roche materiality process providing the definition for the development of its adherence to GRI's environmental, social and economic reporting requirements addressing the soundness of the identification process, determination of impacted stakeholders, peer and competition review, integration of relevant regulatory requirements, integration of key organisational values and objectives and report prioritisation of material aspects;

Inspecting the integration of the sustainability risks and opportunities in the Group Risk Management Process and its adherence to the internal guidelines;

- *Assessment of the processes and data consolidation*

Reviewing the management and Sustainability Reporting processes for SHE, contributions and people key figures; and Assessing the consolidation process of data at Roche Group level.

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

Conclusion

Based on our work performed and described in this report on the identified Roche Sustainability Reporting 2018 nothing has come to our attention causing us to believe that in all material respects:

- the Roche Group internal sustainability reporting guidelines based on the 'GRI Standards' as well as the 'CEFIC Guidelines' are not applied;
- the Roche materiality determination process at corporate level as disclosed does not adhere to the principles and guiding factors (e.g. soundness, stakeholder determination, peer review, relevance of regulatory environment, integration of key organisational values and objectives) defined with the 'GRI Standards';
- the design of the sustainability risks and opportunities determination process at corporate level as disclosed does not function as designed;
- the internal reporting processes to collect and aggregate SHE, people and contributions data are not functioning as designed and provide an appropriate basis for its disclosure;
- the sustainability information mentioned in the subject matter and disclosed within the Sustainability Reporting in the Roche Annual Report 2018 is not stated in accordance with the reporting criteria.

PricewaterhouseCoopers AG

Christophe Bourgoin

Fabienne Fricker

Zurich, 30 January 2019



Modern technologies, digitalisation and sophisticated data analysis support scientists at Roche in research and product development. The picture shows a scientist preparing a sample for further analysis.

Key dates for 2019

Annual General Meeting

5 March 2019

First-quarter sales

17 April 2019

Half-year results

25 July 2019

Nine months sales

16 October 2019

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Cautionary statement regarding forward-looking statements

This Annual Report contains certain forward-looking statements. These forward-looking statements may be identified by words such as ‘believes,’ ‘expects,’ ‘anticipates,’ ‘projects,’ ‘intends,’ ‘should,’ ‘seeks,’ ‘estimates,’ ‘future’ or similar expressions or by discussion of, among other things, strategy, goals, plans or intentions. Various factors may cause actual results to differ materially in the future from those reflected in forward-looking statements contained in this Annual Report, among others: (1) pricing and product initiatives of competitors; (2) legislative and regulatory developments and economic conditions; (3) delay or inability in obtaining regulatory approvals or bringing products to market; (4) fluctuations in currency exchange rates and general financial market conditions; (5) uncertainties in the discovery, development or marketing of new products or new uses of existing products, including without limitation negative results of clinical trials or research projects, unexpected side effects of pipeline or marketed products; (6) increased government pricing pressures; (7) interruptions in production; (8) loss of or inability to obtain adequate protection for intellectual property rights; (9) litigation; (10) loss of key executives or other employees; and (11) adverse publicity and news coverage.

The statement regarding earnings per share growth is not a profit forecast and should not be interpreted to mean that Roche’s earnings or earnings per share for 2019 or any subsequent period will necessarily match or exceed the historical published earnings or earnings per share of Roche.

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The Roche Annual Report is published in German and English.

Our reporting consists of the actual Annual Report and of the Finance Report and contains the annual financial statements and the consolidated financial statements. With regards to content, the Management Report as per the Articles of Incorporation consists of both aforementioned reports with the exception of the Remuneration Report.

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We share one purpose.

*Doing
now
what
patients
need next*

We believe it's urgent to deliver medical solutions right now—even as we develop innovations for the future. We are passionate about transforming patients' lives. We are courageous in both decision and action. And we believe that good business means a better world.

That is why we come to work each day. We commit ourselves to scientific rigour, unassailable ethics, and access to medical innovations for all. We do this today to build a better tomorrow.

We are proud of who we are, what we do, and how we do it. We are many, working as one across functions, across companies, and across the world.

We are Roche.

F. Hoffmann-La Roche Ltd
4070 Basel, Switzerland

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HER JOURNEY TO RECOVERY

The woman shown on the cover of the Roche Annual Report this year appeared on the cover of our 2017 report as well. Last year she was in the midst of receiving treatment for her breast cancer when photographed and this came through powerfully on the cover.

Now, a year later, she is enjoying life again.