

Annual Report 2021



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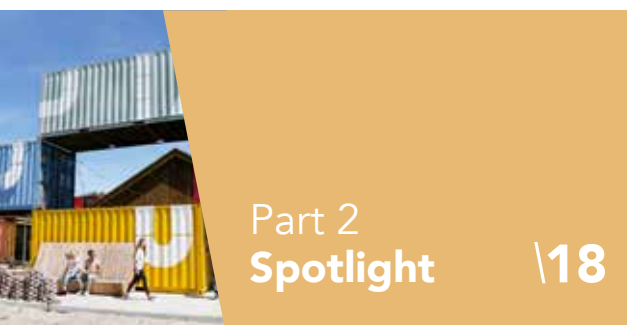


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Updates

Via our newsletter: rathenau.nl/nl/nieuwsbrief and  Twitter,  LinkedIn,  Facebook and  Instagram

Foreword

In 2021, the Rathenau Instituut celebrated its 35th anniversary. A celebration was planned for the autumn, with a magazine in which stakeholders could say something about the institute, perhaps even an anniversary volume. As a precursor, an anniversary meeting of former employees was held on 18 June. Unfortunately, due to COVID-19 measures, it had to take place online but the enthusiastic performance of the guest of honour did everyone a lot of good. In shirt sleeves, former Minister of Education, Culture and Science Wim Deetman explained why he founded the Rathenau Instituut in 1986 and why it still plays an important role today.

Not long afterwards, everything changed. In mid-August, staff and management received the shocking news that director Melanie Peters had died. A bundle of indestructible energy was no more. Melanie Peters, the woman who was always on hand everywhere, who had a kind word for everyone and made time for them. Her death resonates in the Rathenau Instituut to this day.



Maria Henneman

Photograph: Valerie Kuypers

Melanie had been ill for some time. She had been quite open about this but did not want to be treated like a patient. Few people realised that she had a serious illness. Just as she did at the beginning of the COVID-19 pandemic when most office work had ceased, Melanie continued to pay window visits to colleagues during the second year of the pandemic. Through extensive e-mails, she kept all the homeworkers informed of what everyone was doing.

In those e-mails, she also talked about her own activities, including her digital visit to the Social Affairs and Employment Committee of the House of Representatives, in which she explained how our institute could assist the committee's work. In the Portuguese Parliament, she explained (also digitally) why it was important for elected representatives to have scientific advice. She closed every e-mail with a picture of herself or an avatar with an uplifting comment, such as "Take care of each other" or "Hang on in there, it's almost spring".

Melanie's death and COVID-19 left an indelible mark on the second major issue on the agenda in 2021. For the first time since 2008, the Rathenau Instituut is again presiding over the EPTA network, the international association of over 20 institutes doing similar work. At the end of April, Melanie chaired the directors' meeting that decided to produce a joint publication on the ways different countries were responding to COVID-19 and the lessons learned. The final report was presented at an online conference in the autumn, without Melanie.

The Rathenau Instituut sent a Message to Parliament about COVID-19 earlier in 2021. This concerned the government's plans to open up society again a little by introducing what was then referred to as a COVID-19 passport, subsequently known as the QR code. We drew the attention of the House of Representatives to the various fundamental and human rights that this violated. We also emphasised the importance of periodically assessing whether this passport was still necessary.

It was an example of the advice and reports that the Rathenau Instituut is known for. Or as Melanie said in 2020: "What our digital future looks like is largely up to us. The Rathenau Instituut helps citizens, politicians, policymakers and civil society organisations to understand this."

“Digital society” is one of the four themes in the 2021-2022 work programme, in addition to “making perfect lives”, “democratic information society” and “robust science and knowledge ecosystems”. The thirteen reports and eight Messages to Parliament published in 2021 provide important insights into these themes, which are discussed below in this annual report. The same applies to the thirty-one dialogue sessions held.

At this juncture, I would like to mention a number of eye-catching reports. For example, we completed the DNA dialogue that we had been organising with other institutions for three years on the subject of modifying DNA from embryos. Based on interviews held in community centres and theatres, at fairs and in schools, it appears that the Dutch are not fundamentally opposed to the new CRISPR-Cas technology that could make this possible. This must be subject to strict conditions and done for specific purposes though, such as the prevention of serious hereditary diseases.

In 2021, we also completed a study on ways of improving public engagement with science. Case studies of public engagement in research into psychiatry, education and water quality show, among other things, that it can lead to more relevant research results. This, in turn, can help to consolidate trust in science.

Our three-yearly survey shows that the Dutch had a high level of trust in science in 2021. At 7.4, the score that the Dutch gave for trust in science was higher than ever. But, partly based on work with focus groups, we also warned that this trust could quickly evaporate again if the dividing line between science and politics became blurred.

How much the Dutch government, industry and non-profit sector invest in science is shown in our annual TWIN report. The 2021 edition shows a substantial increase over the coming years, especially thanks to the National Growth Fund.

A new fact sheet on China’s performance shows that we are certainly not the only country to see the importance of investing in science and innovation. Twenty-five years ago, China was spending as much on R&D as the Netherlands, now it spends as much as the twenty-seven EU countries combined. It will probably not be long before it overtakes the United States as well.

The year 2021 also heralded in some administrative changes. After eight years of heartfelt commitment as chair of the board, Gerdi Verbeet will pass the baton to the undersigned in the summer. For Gerdi, humanity and contact with others is at the heart of the Rathenau Instituut’s work. She hopes these values will continue to be safeguarded in future.

After Melanie’s death, the board and staff took the time to consider who should take over as head of the Rathenau Instituut. To allow breathing space for this, Henk de Jong, an experienced interim manager, was appointed in October for at least six months.

The year 2021 is etched into our memory by the passing of Melanie Peters. She emphasised that science, technology and innovation can only flourish if they incorporate public values such as humanity, inclusiveness and human rights. We are determined to make that legacy grow and prosper.

Maria Henneman

Chair of the Rathenau Instituut Board

Continuing to deliver on our mission in a difficult year

The very sad death of Melanie Peters in August made it necessary for the board, management and staff to make a concerted effort to deal with her loss. This was an emotionally demanding situation in which many people had to work hard. It became clear how much Melanie did as a director and what gaps were left by her sudden absence.

Under these difficult circumstances, I was allowed to start work as temporary director at the Rathenau Instituut on 11 October. I was truly impressed by the warmth, professionalism and resilience of everyone involved. Within the institute, new ways of operating had already emerged. Important stakeholders had come forward with offers of help if the need arose. All of us at the Rathenau Instituut are very grateful for the kind responses we received during this complicated phase.

At the same time, the work had to go on and the outside world expected us to provide help and perspective on important issues in our work programme



Henk de Jong

through research and dialogue. For example, the various committees in the House of Representatives were gradually becoming more firmly established. Many of the issues highlighted in this annual report required our presence and interpretation. I am impressed by how our staff performed in the Senate, the House of Representatives and the European Parliament. Our presidency of the European Parliamentary Technology Assessment (EPTA) network was to be continued, including our work on the COVID-19 joint study. Our coordinators and researchers played starring roles.

In October, we were able to come into the office a little bit more to meet, work together and prepare dialogues in physical settings. We were all really ready for that. Unfortunately, COVID-19 caught up with us again and we had to return to our attic rooms and other home offices.

The year 2021 became a year of major unforeseen events. It was a difficult year. Nevertheless, we all succeeded in making a relevant contribution to society and in fulfilling our social mission. We have only been able to do so thanks to the major commitment and impressive adaptability of our staff, the unflagging support of our board, fine cooperation within the Royal Netherlands Academy of Arts and Sciences and the sympathy, understanding and help of important players in our sphere of activity. We became stronger together in 2021.

At the time of writing, we are now in 2022 and preparations for the arrival of a new permanent director are in full swing. In addition to our "regular" work, we are also preparing the five-yearly evaluation of our institute. We look forward to commencing a new period for the 2023-2024 work programme. The Rathenau Instituut is in a good position and has splendid prospects through research and dialogue. This annual report is a good illustration of this.

Henk de Jong

Director, Rathenau Instituut

Melanie Peters (1965-2021)

On 11 August 2021, our director Melanie Peters passed away. Melanie had been ill for some time but, because she continued to work energetically despite this illness, her death came as a complete surprise to the entire institute.

Melanie joined the Rathenau Instituut as director at the end of 2015 and it made a tremendous leap forward on her watch. Uniquely, she was able to make the impact of science, technology and innovation on society tangible and understandable.

Melanie represented the Rathenau Instituut as a whole. She thought it was important that employees from different teams and departments knew what they were working on. "We do it together", colleagues often heard her say. "Good teamwork", she liked to write in her mail and apps.

On her watch, cooperation also became a common thread in the Rathenau Instituut's research and working methods. The institute established closer contacts with organisations nationally and internationally. It studied partnerships in science, technology and innovation and emphasised the importance of dialogue between parties with conflicting interests, for example on the ammonia issue or DNA modification. For Melanie, working together meant taking account of everyone's task and responsibility. Finding solutions for major social issues, she believed, required a diversity of disciplines and perspectives.



Photograph: Dirk Hol

Melanie was passionate about the quality of the debate surrounding science, technology and innovation in society. The social perspective from which the Rathenau Instituut works was by no means a vague concept to her. It means protecting public values such as inclusiveness, justice and citizens' rights. "We have to talk to each other" may sound as if she was just being friendly, but Melanie did not mean it in a non-committal way. It was a firm exhortation to say what needed to be said, both amongst colleagues and in the public and political debate, in which she was closely involved as a director. And a good partnership, she said, was also allowed to fray at the edges, or even falter, from time to time. Sometimes it did.

Her broad interest and involvement also translated into an exceptionally large network on which the Rathenau Instituut could build. Melanie had an amazing memory, a rich associative mind, was a lightning quick thinker and doer, and made connections that others could not yet see. She was sometimes inimitable, not only figuratively but also literally. She was never really to be found behind her desk; like a top-class sprinter, she ran from appointment to appointment.

Melanie was a warm and caring person with an eye both for the big picture and for small things. It was people that meant most to her. Anyone who became bogged down in life would encounter her gentle and compassionate side. And with regard to research she would ask questions such as: "Can everyone participate in the digital society?" "Is everyone reaping the benefits of the knowledge economy?" With Melanie as director, these became guiding questions for the Rathenau Instituut. When COVID-19 forced employees to work from home, she stressed the importance of human contact. "Keep your distance, but stay close".

Due to COVID-19 restrictions, only a limited number of colleagues were able to attend Melanie's funeral in August. In the autumn, staff members and the board, together with the immediate family, organised a memorial service for Melanie at the Centraal Museum in her home town of Utrecht.

Part 1

Impact

Media appearances, lectures at home and abroad and various forms of support for the Senate and House of Representatives. This section describes some of our activities to stimulate public debate on science, technology and innovation in 2021.



Photograph: Peter Hilz / ANP / Hollandse Hoogte

Rathenau Instituut holder of EPTA presidency

In 2021, the Rathenau Instituut held the presidency of the European Parliamentary Technology Assessment (EPTA) network, an international alliance of institutions doing similar work to ours. The presidency rotates annually among the twenty-five members and associate members. As a result of COVID-19, most activities took place online.

At the two-day directors' meeting held at the end of April, EPTA members decided to devote their annual joint report to the lessons countries can learn from each other on combating the COVID-19 pandemic.

The report, published at the joint autumn conference on 9 November, provides an overview of how policymakers in sixteen countries have used scientific knowledge, technology and innovation in the COVID-19 pandemic (see also page 28). In addition to European countries, countries such as the United States, Chile and South Korea are also covered. The report was presented to Mark Roscam Abbing, Programme Director-General, Society and COVID-19 of the Dutch government. Experts went on to discuss the lessons to be learned and how digitalisation can be used to make societies more resilient.

The President of the House of Representatives, Vera Bergkamp, opened the directors' meeting, that took place the day before the conference. In her speech, she emphasised how the COVID-19 pandemic has accelerated the digitalisation of society. She said she expects elected representatives and their staff to continue to follow a hybrid work schedule even after the pandemic and pointed to the opportunities this creates for closer cooperation between parliaments. She also pointed out that Dutch parliamentarians wanted to strengthen their understanding of digitalisation through the new Digital Affairs Committee, which the House of Representatives set up in 2021.

To draw attention to our presidency, we published a series of articles on our website concerning some of our sister organisations. For this purpose we spoke to EPTA members from Norway, Germany, Portugal, Switzerland, Wallonia and Finland. One of the questions raised in each article was what we as countries could learn from each other.

Two new members joined EPTA during the Dutch presidency: the Spanish Science and Technology Foundation (FECYT) and Lithuania's Committee for the Future. On 1 January 2022, the EPTA presidency passed to the Büro für Technikfolgen-Abschätzung (TAB) which advises the German Bundestag.



The EPTA autumn conference focused on the lessons learned from the approach to COVID-19.

Photograph: Rathenau Instituut

In conversation



Researcher Wouter Nieuwenhuizen in conversation with visitors to Dutch Design Week 2021
Photograph: Rathenau Instituut

A guest lesson for senior citizens on artificial intelligence in healthcare. A workshop on digitalisation for local council registrars. A lecture for parliamentarians from the Benelux Parliament on disinformation. And our work received 423 mentions in online and other media. In 2021, we engaged in a multi-faceted public dialogue about our research.

Dutch Design Week 2021

In conversation on the subjects of synthetic life, online safety and innovation policy

Dutch Design Week was held in Eindhoven from 16 to 24 October 2021. Researchers from the Rathenau Instituut talked to visitors about three topics relating to science, technology and innovation.

In the Netherlands, scientists are working on the construction of a synthetic cell. Unlike biotechnology to date, this is not about improving existing life forms, but creating entirely new life. What is a synthetic cell and what does it mean for our existence?

Together with designer Mies Loogman, the Rathenau Instituut invited visitors to Dutch Design Week to discuss this topic. They were shown an installation: a cradle and test tubes full of colourful aniseed comfits [Dutch rusk with aniseed comfits is a traditional Dutch treat when a baby is born]. On greeting cards they could, for example, describe the characteristics they hoped the creators would give the new life. Besides the conversations at Dutch Design Week, we published the podcast series *Herschept* [Re-created] with Mies Loogman in 2021, in which we investigated the story behind the development of the synthetic cell together with experts and scientists.

Another project related to online safety. Visitors took the "Online Safety Test", when they were shown examples of harmful and immoral behaviour online in an animation. Afterwards, they discussed issues including their own safety on the Internet, or the role of the government and platform operators.

Researcher Wouter Nieuwenhuizen spoke at a conference on contemporary safety issues. He explained findings from our report "Harmful behaviour online" (2021). Our activities on online safety were organised with the "Embassy of Safety".



Visitors to Dutch Design Week 2021 next to an installation where designer Mies Loogman and the Rathenau Instituut invited them to a conversation about synthetic life.

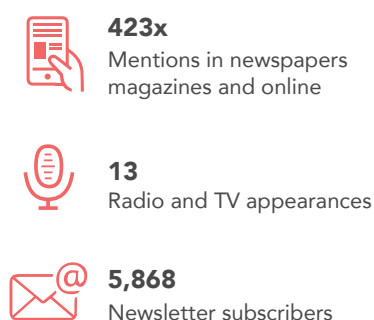
Photograph: Rathenau Instituut

This is a partnership of parties from the security domain, such as the Public Prosecutor's Office, the National Police, Probation Service Netherlands and VNG.

A panel discussion on innovation policy was the Rathenau Instituut's third project at Dutch Design Week. Challenges such as keeping healthcare affordable or sustainable food production require more than just technological innovations. Structural changes in society are needed, but how do we bring them about? The Rathenau Instituut is conducting research into this.

Researcher Amber Geurts said that it is important to take into account what practice teaches us: what do we want to achieve and what do we need to do so? As well as government and industry, civil-society organisations and members of the public have a role to play in the transitions of our society.

The Rathenau Instituut in figures:



Workshop for Gelderland Academy

Online, 15 January

On the occasion of the Day for Council Registrars of the District of Gelderland, Paul Diederer and Djurre Das organised a workshop for council registrars in Gelderland. They presented the report Raad weten met digitalisering on how municipal councils can properly conduct the debate on issues relating to the digital society.



Relationship Advice for the Metropolitan Region of Rotterdam, The Hague

Online, 20 May

How can higher education institutions become a knowledge partner of municipalities? What are the tensions that arise in this situation? Jasper Deuten shared insights from our report Stad zoekt toga with members of campus network MRDH.

Educating senior citizens about artificial intelligence

Groningen, 2 December

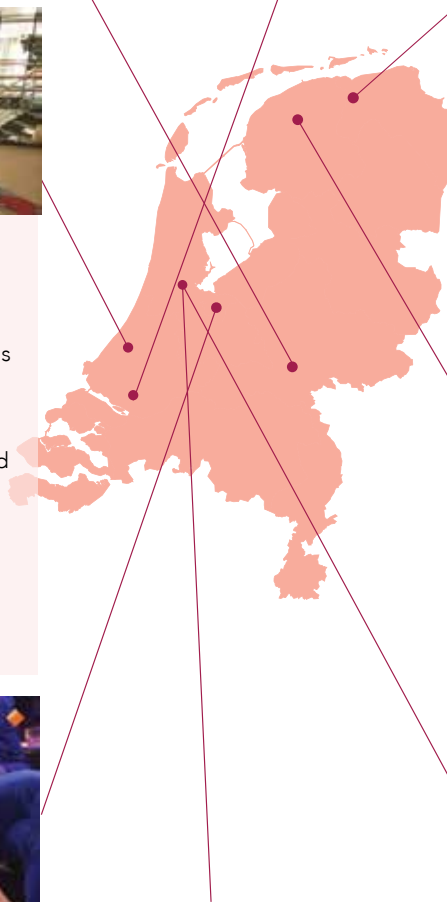
How can we use artificial intelligence in a worthwhile way for our health? This question was central to Petra Verhoef's guest lecture "Artificial intelligence: curse or blessing?", which she gave senior citizens following adult education courses at the Higher Education for Older People (HOVO) in the north of the Netherlands.



National Science Day

The Hague, 13 October

What knowledge does central government need to develop policies for the digital society? Ten ministries have set up the government-wide Online Society Knowledge Agenda with the cooperation of scientists and researchers from planning agencies and knowledge institutes. At the presentation of this knowledge platform, Laurens Hessels gave a keynote speech on the need for knowledge co-production.



Ethics and local government in the digital society

Leeuwarden, 11 October

What ethical questions do local government and politicians face with the digitalisation of society? Bart Karstens spoke to Leeuwarden city council about the role of the council in responsible digital innovation, for example with regard to data control, transparency and accessibility.



NPO Innovation Festival

Hilversum, 3 June

At the NPO Innovation Festival, Mariëtte van Huijstee spoke to journalists and creators, among others, about AI-generated images, sounds and text. For example, you can correct slips of the tongue or iron out inconsistencies in an image. Risks of this technology include causing confusion about what is real or fake and reducing trust in news and other media.

Control and security in the digital society

Amsterdam, 13 November

With virtual reality, augmented reality and speech technology, our body movements, sounds and facial expressions are digitally cloned and adapted. How do we maintain control over our digital bodies? This was the subject Linda Kool addressed as a speaker at Immersive Tech Week.



"Make a deepfake" workshop

Amsterdam, 9 September

What are deepfake videos? How can you tell whether a film is real? Pieter van Boheemen organised the "Make a deepfake" workshop in The Studio at NEMO Science Museum, where some 30 visitors tried out the technology.

European policy on deepfakes

Brussels/online, 15 October

The European Parliament's Panel for the Future of Science and Technology commissioned the Rathenau Instituut, together with European sister institutions, to write the report Tackling deepfakes in European policy, on the opportunities and risks of manipulated sound and vision. Mariëtte van Huijstee presented the findings to parliamentarians and other interested parties.



The Danish success in innovation policy for wind energy

Copenhagen/online, 16 March

What lessons can we learn from the Danish innovation policy for wind energy? Combine visionary politics with pragmatic policies. Rinie van Est presented his paper on this during the workshop "Successful Public Policy: Lessons from the Nordic Countries" from the Copenhagen Business School. He also gave feedback on draft chapters for a book (scheduled for 2022).



Gene editing of plants

Seattle/online, 25 June

Michelle Habets and Prof. Phil Macnaghten gave a joint lecture at the 31st International Conference on Arabidopsis Research. In "Breaking the impasse: Towards a forward-looking governance framework for gene editing with plants", they called on plant scientists to participate independently and impartially in the public and political debate on regulating the genetic modification of plants.

Modifying human DNA

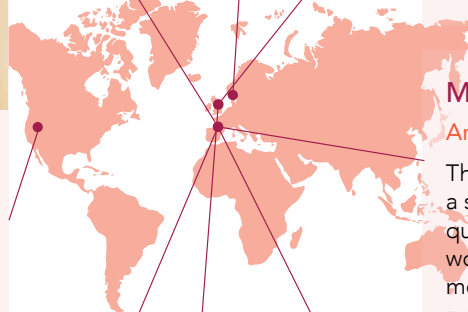
Oxford/Amsterdam/online, 8 June

During the Oxford-Amsterdam Spring School, PhD students from Oxford presented their research on bioethics in Amsterdam. Jeroen Gouman gave feedback to a student who is researching ethical issues arising from the modification of human DNA.

Monitoring at work

Antwerp, 20 October

The Belgian trade union ACV organised a symposium on digitalisation and quality of work. Djurre Das held a workshop for union members on monitoring workers, based on our report Valued at work and recent scientific insights.



Combating disinformation, avoiding censorship

Eupen/online, 15 October

The Benelux Parliament organised a conference on disinformation and fake news. Pieter van Boheemen spoke to parliamentarians and companies such as YouTube and Facebook about the responsibility of social media companies. He presented the "due diligence cycle": a way for a platform operator to identify disinformation, prevent its spread and for regulators to monitor it.

Bioethics in international policy

London/online, 26 May

The Nuffield Council on Bioethics conducts independent research into ethical issues in biology and medicine. The council organised a workshop on trends, opportunities and challenges for the international regulation of bioethical issues. Sophie van Baalen was in attendance, alongside representatives from the Council of Europe, the OECD and other scientists.



Sustainable innovation in Flanders

Brussels, 23 November

Petra Verhoef gave a lecture for the network of the Royal Flemish Academy of Belgium for Science and the Arts (KVAB) on Flemish knowledge and innovation policy for the transition to a more sustainable food system in Flanders. The symposium was part of the KVAB Thinkers' Programme 2021/2022 on sustainable innovation.

In the media

The Rathenau Instituut was frequently cited in various online and other media in 2021. Below is a selection.

Modifying embryo DNA

"But the technology for modifying DNA is developing faster than the debate surrounding its desirability, as eleven civil-society organisations, including Erasmus MC, Erfocentrum, NEMO Kennislink, NPV Zorg voor het Leven and the Rathenau Instituut observed in 2018. During the period 2019/2020, they therefore decided to actively seek to open up a public dialogue and received financial support for this from the Dutch government. The results were presented online on Monday to Charles Wijnker, Acting Director-General of Public Health at the Ministry of Health."

Nederlands Dagblad, 26 January 2021 \ on *Results of the DNA dialogue*

Digitalisation in municipal councils

"It's not the first time that data knowledge and use by governments has been under the microscope. For example, the Rathenau Instituut stated last year that digitalisation receives little attention from municipal councils. According to the researchers, the focus is too much on "what are we allowed to do?" instead of "what do we want?"

Stadszaken.nl, 9 February 2021 \ on *Knowing how to deal with digitalisation*

Open science

"From thinking up good questions to counting garden birds, people like to lend a hand in scientific research. But scientists should involve them more often, argues the Rathenau Instituut in a new report."

Digitaal Universiteitsblad UU, 24 February 2021 \ on *Moving forward together with open science*

Investing in innovation

"More government investment is needed to achieve the stated ambitions, according to the Rathenau Instituut. New, knowledge-intensive companies can also contribute."

Het Financieele Dagblad, 2 March 2021 \ on our annual publication *Totale investeringen in wetenschap en innovatie* [Total investment in science and innovation]

Financial incentives at universities

"The Rathenau Instituut stated in 2016 that 'there is an incentive for individual universities to have more students and PhD students than the other universities, but that it would actually be better for the collective to limit the numbers'".

De Correspondent, 23 March 2021 \ on *Spinning plates. Funding streams and prioritisation in Dutch university research*.

Monitoring of workers

"The use of work data to make production more efficient is far from new – Taylorism and Fordism were already in existence at the beginning of the twentieth century. The Rathenau Instituut's very readable report *Valued at work* tells the history of monitoring on the shop floor. Developments in technology obviously play a major role in this."

Follow the Money, 3 March 2021 \ on *Valued at work*

"You give out sensitive personal data, you are being profiled, and that creates a feeling of insecurity, because you are treated like a suspect".

Researcher Bart Karstens in *NRC*, 7 April 2021, on the use of anti-spyware by universities and colleges

Trust in science in times of COVID-19

"The Dutch have significantly more trust in science than three years ago. In 2018, science received a 7.1 rating for trust in a three-yearly survey by the Rathenau Instituut. In a survey conducted last spring, the figure was 7.4 per cent, the institute writes."

NOS.nl, 9 July 2021 \ on *Trust in science in the Netherlands (2021 survey)*

Harmful behaviour online

"Unwanted behaviour on the Internet causes serious harm. Both the individual and society as a whole experience the negative consequences of, for example, hate speech, phishing, pornography addiction, extreme challenges and conspiracy theories. This is evident from the alarming report "Harmful behaviour online", published by the Rathenau Instituut last week."

Reformatisch Dagblad, 20 July 2021 \ on *Harmful behaviour online*

Doxing

"As there are no figures available, it is not possible to talk about an increase in doxing. This is the conclusion of the researchers from the Rathenau Instituut in their recent report on harmful and immoral behaviour online (Harmful behaviour online). They do see that doxing has become more visible since the COVID-19 pandemic began. This is one of the reasons why the Rathenau Instituut is arguing for a national reporting centre, so that society can get a better idea of the nature and extent of online harassment, including doxing."

VPRO.nl/Argos, 7 September 2021 \ on *Harmful behaviour online*

Tech platforms

"We need quick action to find better ways of embedding this vital infrastructure in a democratic state under the rule of law. Not by bringing them under state control with a show of force, as is now happening in Russia, quite the contrary. But by bringing them more under the influence of the citizens, parliaments and courts. That is no easy matter. The Rathenau Instituut gave a first impetus this week in its new report 'The state of digital Netherlands.'"

NRC, 22 September 2021 \ on *The state of digital Netherlands*

Rising trust in science

"It is also good to know that trust in science in the Netherlands is still relatively high and has even risen somewhat. On a scale of 1 to 10, the Dutch rated their trust in science with a score of 7.4 this year, according to research by the Rathenau Instituut. In 2018, it was still 7.07."

Flaironline.nl, 17 November 2021 \ on *Trust in science in the Netherlands (2021 survey)*

Funding of fundamental research

"It is a system that receives a lot of criticism, especially because of the workload it places on applicants. At the end of the day, according to research by the Rathenau Instituut, Dutch scientists spent between 5 and 9 percent of their working hours raising money in 2017."

de Volkskrant, 26 November 2021 \ on *Researcher and teacher motivation survey (2018)*

"You shouldn't beat people over the head with facts, however tempting it may be for a scientist with hard data. [...] In order to understand the other person's point of view, it's better to have a serious discussion about any concerns that exist. That prevents trench warfare."

Researcher Anne-Floor Scholvinck in the magazine of the Netherlands Organisation for Scientific Research (NWO) *Onderzoek* (Autumn 2021)

On the agenda



Theme coordinator Alexandra Vennekens in discussion with the Education, Culture and Science (OCW) committee in the House of Representatives
Photograph: Dirk Hol

In 2021, the Rathenau Instituut shared its knowledge with the House of Representatives, the Senate and the European Parliament in various ways, for example by sending Messages to Parliament in support of various debates, being available for technical briefings and round-table discussions, and supporting MPs individually if required. The Rathenau Instituut is mentioned 548 times in official documents of the Senate and House of Representatives and is referred to in 148 Letters to Parliament or Messages to Parliament. The following pages give an impression of some of our activities.

Knowledge at the service of political decision-making

The government having taken a historically long time to form, its status was that of a caretaker government for a prolonged period. The Rathenau Instituut continued to support political decision-making, even during this period of uncertainty for many parties. For example, the Senate wanted to increase its knowledge of the government's use of algorithms and AI, so that it could better perform its legislative and supervisory task. The Standing Committee for Justice and Security therefore organised three expert meetings on this theme, in collaboration with the Rathenau Instituut. By way of preparation, we wrote the memorandum *Grip op algoritmische besluitvorming bij de overheid* [Understanding algorithmic decision-making in government]. *The role of the Senate*. In this memorandum, the Rathenau Instituut summarised the concerns expressed about the social impact of AI decision-making in government.

The establishment of the House Committee on Digital Affairs also became a reality in 2021. A formal introduction to the Rathenau Instituut followed, as did the introduction to the temporary rapporteurs for the Digital Services Act and the Digital Markets Act for this committee. They issued their final report in the same year, partly based on our Message to Parliament *De toekomst van online platformen* [The future of online platforms]. Following our report *Valued at work*, written on behalf of the Social Affairs and Employment Committee in 2020, a round-table discussion took place within the same committee with the changing labour



Theme coordinator Linda Kool and researcher Jurriën Hamer in the Senate

Photograph: Rathenau Instituut

market as its main theme. For this purpose, we wrote our position paper *Afspraken nodig over de inzet van data en monitoringstechnologie op de werkvloer* [Agreements needed on the use of data and monitoring technology in the workplace]. On behalf of the OCW committee, we took part in a round table discussion on scientific cooperation with so-called non-free countries, which we reported on earlier in the report *Kennisveiligheid in hoger onderwijs en wetenschap* [Knowledge security in higher education and science].

“The question is therefore not: do we need more or fewer data centres? But: which data centres do we need – and how and where can we locate them?”

Researchers Eef Masson and Gido van Rooijen in *Het Parool*, 9 April 2021

In the political arena

Insights from the Rathenau Instituut were frequently used in Parliamentary debates in 2021. Below is a selection.

"Delighted that the State Secretary endorses Rathenau recommendations"

"The members of the GroenLinks parliamentary group have noted with great interest the Rathenau report on virtual reality and the government's response to it. These members are delighted to read that the State Secretary endorses the recommendations in the Rathenau report."

Members of the GroenLinks parliamentary group referred to our report Responsible VR in a written consultation with State Secretary Mona Keijzer (EZK) on the successes of the working group on space mining.

"How does the Minister rate the Rathenau Instituut's analysis?"

"According to the Rathenau Instituut, the combination of more relaxed rules for gene therapy, the higher risks and the lack of public access to research data in the Netherlands means that more transparency must be demanded from research institutes and companies, also when monitoring effectiveness during the application phase. How does the Minister rate the Rathenau Instituut's analysis?"

During a written consultation on Biotechnology and Horticulture, members of the SGP parliamentary group asked Minister Carola Schouten's (LNV) views on our Message to Parliament on gene therapy. Integrated policy needed to facilitate gene therapy.

"Thanks to the Rathenau Instituut for the thorough research".

"I thank the Rathenau Instituut's researchers for their thorough research. [...] The successful exploitation of the opportunities of digitalisation will only be possible if the social consequences are adequately monitored. This report is an important exploratory step."

At the request of Member of Parliament Bart van Kent (SP), Minister Wouter Koolmees (SZW) gave a government response to the report Valued at work.

"Depending on the outcome, OCW and VWS will enter into discussions".

"I am sending you the response to the request from the OCW Committee prompted by the message

"Performance-enhancing drugs in young people: taking a broader perspective" from Rathenau, 11 June 2020. The Rathenau Instituut message expresses concerns about the alleged increased use of drugs by students to enhance their academic performance, including ADHD medication. [...] Depending on the results of this study, the Ministry of Education, Culture and Science and the Ministry of Health, Welfare and Sport (VWS) will discuss possible measures to discourage the use of (undesirable) drugs and substances among higher education students."

At the request of the OCW House Committee, Minister Ingrid van Engelshoven (OCW) gave a government response to our Message to Parliament: Performance-enhancing drugs in young people: taking a broader perspective.

"The Rathenau Instituut makes a very fine distinction"

"As far as I am concerned, the scientific Rathenau Instituut makes a very fine distinction. It talks about freedom of speech and freedom of reach."

Member of Parliament Queeny Rajkowski (VVD) is referring to a conversation she had with us in her role as DSA/DMA rapporteur, during an interruption in the debate on the Competitiveness Council (Internal Market, Industry, Research and Space) (formal).

"Public agreement on final disposal of radioactive waste"

"I therefore awarded a multi-year assignment in 2019 to think through a participatory decision-making process to this end, aimed at reaching a public agreement on the final disposal of radioactive waste and spent nuclear fuels. The Rathenau Instituut was awarded this assignment." State Secretary Stientje van Veldhoven-Van der Meer (Infrastructure and Water Management) answers written questions from the Dutch Labour Party about the storage of nuclear waste.

"Focus of regulation currently on illegal content"

"As the Rathenau Instituut indicates in its recent study "Harmful behaviour online", the current focus of regulation is mainly on illegal content and not on other forms of undesirable content."

Minister Kajsa Ollongren (Interior and Kingdom Relations) gives a cabinet response to questions put by Member of Parliament Gideon van Meijeren (FVD) about possible politically motivated censorship by the major social media platforms.

Part 2

Spotlight

The Rathenau Instituut's field of work is wide-ranging. From online safety to donor animals. And from trust in science to investment in innovation. In this part you can read what we have researched in 2021 for each theme.



How do we ensure that digitalisation contributes to the issues we consider important?



Photograph: Travelpixs / Shutterstock

Digitalisation is changing almost every sector of our society. The great challenge is to develop a digital society that contributes to values we hold dear and in which everyone can participate. In 2021 we presented an overview of the state of digitisation in eight different domains of society. We also identified undesirable behaviour on the Internet. In addition, we advised elected representatives on how to keep track of developments that are becoming more and more important, such as artificial intelligence.

We design our digital future today

Keeping an eye and a grip on technology, markets and services

State of digital Netherlands

The digital society is sailing in turbulent waters. That was the conclusion of **De stand van digitaal Nederland** [The state of digital Netherlands], which we published in September. This report was prompted by the formation of the new government and the appointment of the permanent House Committee on Digital Affairs. In this report, we presented the insights from various studies we have been working on in recent years. We reviewed the problems at stake in eight social domains, questions that remain unanswered in the public debate and questions to which politicians will have to find answers in the coming years. We looked at areas including health care, education and public administration. We also formulated three priorities for a new digitisation strategy. For example, the government could provide clear frameworks for digital innovation, and innovations should help create a better society and give professionals and the public a greater say.

AI and ethics

In the context of the international UNESCO Recommendation on the Ethics of Artificial Intelligence adopted in late November, we made the blog series **The World and AI**. In it we published interviews with international experts in which we asked: which aspects do they consider important for this discussion? How does such a recommendation come about? The Rathenau Instituut was designated the national observer for the establishment of the international Recommendation. Leading on from this role, the institute was given the opportunity to monitor and

comment on the content. The Recommendation should help ensure that AI develops in such a way that the technology promotes human rights and contributes to the achievement of the Sustainable Development Goals set by the United Nations.

Political understanding of AI

We assisted the Senate to gain a better understanding of the challenges created by the government's deployment of AI. For this purpose, we wrote **Grip op algoritmische besluitvorming bij de overheid** [Understanding algorithmic decision-making in government], a memorandum on the part that senators could potentially play in this. We also organised four expert meetings at the request of, and in cooperation with, the Standing Committee on Justice and Security. The aim of the meetings was to increase knowledge so that the MPs could improve the way they performed their co-legislative and supervising duties in this field. This included strengthening the legislation governing AI. This can be done, for example, by requiring a so-called *algorithm impact assessment* or banning algorithmic government decisions without human intervention.

To assist in the discussion of the European Commission's AI Regulation in the House of Representatives, we listed seven points worthy of attention. We pointed out that the plans needed to be tightened up to reduce the risk of AI use damaging human rights. Privacy and non-discrimination rights are at particular risk.

“Social media are virtual, dehumanised environments in which you only see account names and avatars, not flesh-and-blood people to whom your messages mean something.”

Theme coordinator Mariëtte van Huijstee in NRC, 26 July 2021, on our report *Harmful behaviour online*

Digital markets and services

The plans presented by the European Commission in late 2020 to regulate the platform economy could be better. That is what we told the House of Representatives, which met several times in 2021 to discuss the proposed new rules for digital markets and services (Digital Markets Act and Digital Services Act). For example, the obligations on platform operators to identify their risks could be more stringent. In our report **Harmful behaviour online** we showed that at least twenty-two forms of harmful behaviour occur online (see next page). Platform users should also be given greater control over what happens to their data.

Digitising Flanders

Like the Netherlands, Flanders has also awakened from the digital dream in which it seemed that technological

progress would automatically lead to social progress. This was the conclusion of theme coordinator Rinie van Est, who was *thinker-in-residence* at the Royal Flemish Academy of Belgium for Science and the Arts (KVAB) for a year. In his concluding essay, he pointed out that the question now is how the government, businesses and individuals can together guide digitalisation in the right direction.

Digital cookery show

Another way of looking at digitalisation was presented by artist in residence Nicky Liebrechts. She made three episodes of a digital cookery show. In it, she spoke to guests about the merging of physical and online identities, Internet access for the visually impaired and the influence of big-tech companies on our identity and world view.

“What is allowed in some countries need not be allowed in the Netherlands. But in order to make a balanced decision, we need to have a dialogue on this issue.”

Theme coordinator Petra Verhoef on *NieuweOogst.nl*, 25 September 2021, about the public dialogue we are organising with NEMO Kennislink on growing organs, tissue and cells in animals for transplantation to humans

Twenty-two forms of harmful and immoral behaviour on the Internet

Active regulator needed to tackle harmful behaviour online

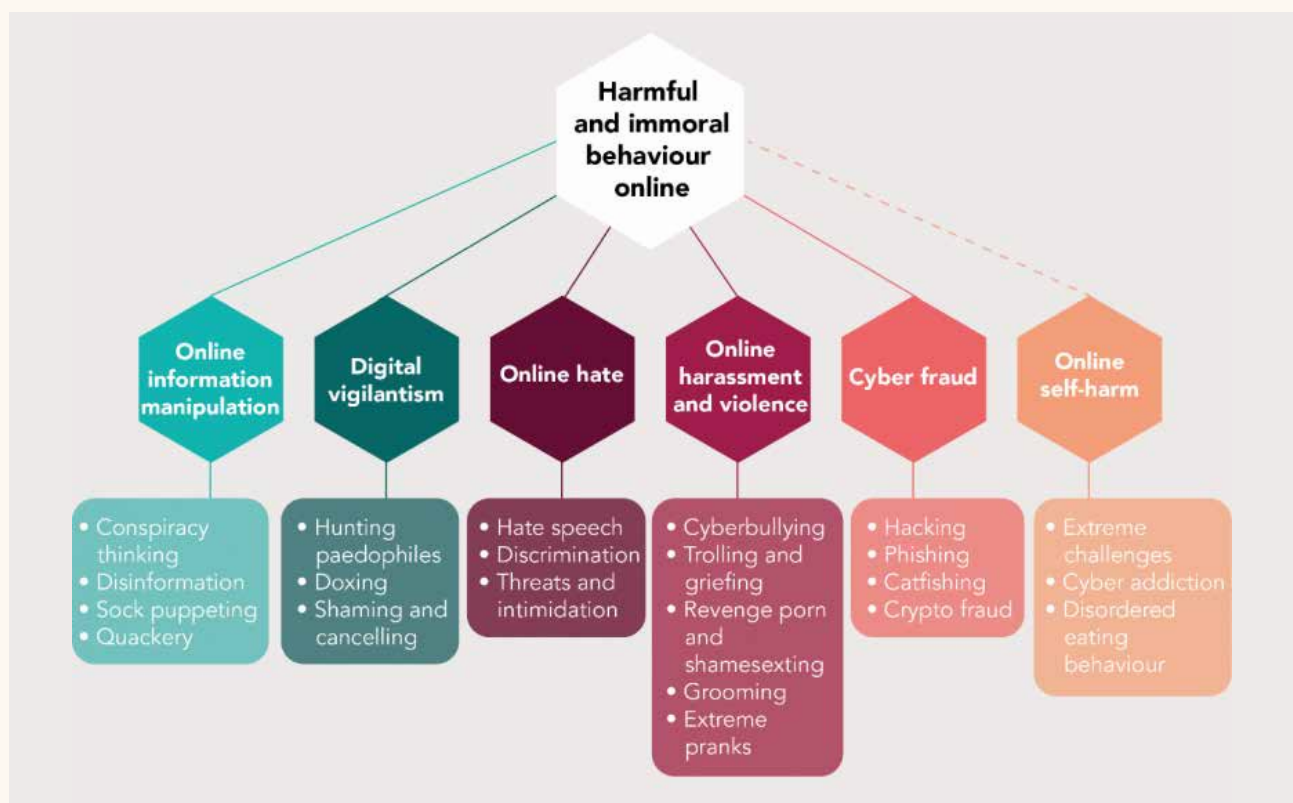
The public are insufficiently protected from harmful and immoral behaviour on the Internet. An active regulator is therefore needed to intervene in the mechanisms that facilitate this kind of behaviour. This is evident from the report "Harmful behaviour online", which was commissioned from the Rathenau Instituut by the knowledge institute for the Ministry of Justice and Security (WODC).

In this report, the Rathenau Instituut presented a list of twenty-two undesirable online behavioural phenomena. These range from cyberbullying, phishing, cyberaddiction and cryptofraud to revenge porn, extreme challenges, paedo-hunting, shaming and cancelling.

The report also discusses the mechanisms of the Internet that facilitate these behaviours. On the Internet,

outrage is a business model. The more emotion, the more attention, and the more attractive it becomes for users and platforms to distribute extreme content. This encourages the spread of disinformation and the blurring of social norms, with major consequences for individuals and society.

To counteract this behaviour, a regulator is needed that does not only react when online behaviour has already gone off the rails. It is also important to intervene proactively in the online environment to prevent harm and protect fundamental rights. To help with this, the Rathenau Instituut has drawn up a strategic agenda. The main requirement is to redesign the Internet with its attention economy, clarify standards of online behaviour and improve ways of protecting victims.



Forms of harmful and immoral behaviour online (from: Harmful behaviour online)

How do science and innovation help tackle societal challenges?



Photograph: Richard Gomez Angel / Unsplash

Societal challenges such as climate change and the future of healthcare require long-term research agendas. Moreover, many parties will have to work together. Who are these parties? What does fruitful cooperation look like? And how will public trust in science be maintained? That is what the Rathenau Instituut is investigating.

Research with impact

Innovations for societal challenges

Tasks, missions, living labs and start-ups

Social impact, challenge-driven innovation policy, mission-oriented research: the terms and definitions have not yet crystallised, but what is certain is that a new trend in science is evolving. This is also evident from the Impact Alliance that we co-founded and from the no fewer than four reports that the Rathenau Instituut wrote on innovations for tackling societal challenges in 2021.

The first report, **Living Labs in VerDus SURF**, brought together the experiences of living labs participants in the *Sustainable Urban Futures* programme of the Connecting Sustainable Cities (VerDuS) knowledge initiative. The second report, **EU-missies voor maatschappelijke opgaven**, analysed the five missions of the EU's Horizon Europe research programme. The EU missions are explicitly intended to involve the less usual parties such as citizens and civil-society organisations, not only in their design but also in their management, implementation and evaluation. The third report, **Research programmes with a mission**, showed that a new way of working is required if the Netherlands is to deploy research in a targeted manner for major social changes. And the fourth report, **Tussen uitvinding en uitdaging**, provided insights into how universities can support start-ups that want to make a positive impact on a societal challenge. The study shows where the problems lie and what action options all parties have to capitalise on unexploited opportunities.

Knowledge security

Screen the visas of foreign researchers, set up committees to assess security risks and make researchers less dependent on companies and other countries. These are three suggestions we make in our Message to Parliament on **Knowledge Security in Higher Education and Science**. International research cooperation and international mobility of scientists are of great importance for the Dutch knowledge economy, but they also entail risks. Research cooperation with

non-free countries entails security risks. For example, it could involve the development of knowledge that may have both civilian and military uses. There are also risks relating to intellectual property, undue influence and human rights.

Inclusive science, but not for everyone

Involving citizens in research is a slow process in the Netherlands. This is evident from, among other things, our report **Moving forward together with open science**. The report presents five steps for involving citizens in a more meaningful way. These steps include avoiding jargon, valuing researchers and giving citizens a say.

Openness and cooperation in science also have their dangers, including brain drain, misuse of knowledge and free-rider behaviour. What happens, for example, if Europe opens up completely but China or the United States do not? At the request of the European Commission, the Rathenau Instituut described a number of future scenarios that will help Europe think about open science and the future. Recommendations in the report **Perspectives on the future of Open Science** include: investing in the standardisation and preservation of research data, creating a clear profile for European science and basing that profile on European values.

Trust in science

The Rathenau Instituut survey, a major triennial quantitative survey, shows that citizens' trust in science is higher than ever. In these days of COVID-19, with fierce debate surrounding disputed science and policy, this finding is astonishing. An explanation of this paradox can be found, for example, in the report **Vertrouwde wetenschap**, which is based precisely on *qualitative research*. This shows that people from different backgrounds need reliable science, especially if it is being used as a basis for government policy. But trust evaporates as soon as the line between science and politics becomes blurred.

Group discussions with citizens about their trust in science

When science becomes political, public trust evaporates but it can be restored

In 2021, the Rathenau Instituut entered into dialogue with citizens for the report **Vertrouwde wetenschap**. We held eight discussions with different groups, including young adults, individuals with little faith in science and critically minded citizens with strong opinions. We presented them with case studies on road safety and food safety and asked them about the relationship between science and government.

The discussions show that citizens place clear requirements on science when it is used to inform public policy. They want politicians to be informed about scientific knowledge but not for scientists and politicians to interfere too much in each other's work. This offers hope that public trust in science can be restored and sustained, even when research is commissioned by the government.



Trust in science is a hotly debated topic and the COVID-19 crisis has only increased its relevance. Especially since the government uses scientific knowledge as a basis for policy.

Photograph: JDzacovsky / Shutterstock

How can we strengthen our democracy?



Photograph: Frank de Roo / ANP

What responsibilities and opportunities do individuals, government, science and industry have to strengthen democracy in the information society? How can everyone participate in the technological society? How can knowledge used in policy lead to trusted and informed political decision-making? And how can democratic control over technology be strengthened?

Too much or too little information

In uncertain times you can fall back on the precautionary principle

Learning to live with deepfakes

We will have to learn to live with deepfakes, protect our virtual identity better and make sure we do not trust anything in the future. That, in a nutshell, is the message of our report **Tackling deepfakes in European policy**. We wrote it together with German and Czech colleagues at the request of the European Parliament. Thanks to artificial intelligence, it is becoming easier to create audiovisual material showing people saying or doing something they never said or did in reality. These deepfakes can be used in medicine, psychiatry, education and in online conferences. But deepfakes can also be used to abuse people virtually. We showed that deepfakes can cause harm not only on an individual level. They can also, for example, discredit a company or political party at group level. At society level, they can create distrust of institutions or population groups.

The report made recommendations for policy focusing on technology, online platforms, creators, victims and the general public. It also recommended increasing the digital resilience of Internet users. The Rathenau Instituut organised a dialogue with fifty Dutch citizens to discuss this resilience as part of a worldwide collaboration. We talked to them about their experience of reading misleading information on the Internet and about possible solutions.

Plea for precautionary measures

Policymakers should learn to deal with uncertainty, especially during crises. If there is a lack of information, standards, values and precautionary measures are crucial to making good policy. This is what we stated in an opinion piece in *Binnenlands Bestuur*, a news platform, partly based on our research into precaution and innovation. We mainly conducted this research within the RECIPES project, a consortium of eleven organisations from seven European countries. In the project, we discuss the precautionary principle on the basis of nine case studies. One case study referred to on our website concerns digital decision support systems in healthcare. This programme will continue in 2022.

Think carefully before introducing a COVID-19 passport. The forthcoming COVID-19 certificate, we wrote to parliament in March 2021, will bring about a change in

current government policy. The principle of behaving responsibly and staying at home in the event of illness is changing to a situation where certain freedoms depend on a formal proof of identity. This conflicts with various fundamental and human rights. In our Message to Parliament, we provided the House of Representatives with seven considerations in preparation for the parliamentary debates on the COVID-19 certificate. The first two considerations were: regularly assess the need for the evidence and refer to the results of experiments in the decisions. These considerations proved to remain important during 2021 and 2022.

Old, but not forgotten

Future-proof living and care for the elderly require innovations on all fronts. That is what we wrote in **Old but not Forgotten**, a Message to Parliament in preparation for a meeting of the House of Representatives on housing and care for the elderly. The issue of care and housing for the elderly is a typical example of what is currently referred to as a societal challenge. In order to tackle these challenges, a new kind of innovation policy is required which is based on an integrated, broad-based approach. The Rathenau Instituut has been researching challenge-driven innovation policy for some time now. In five steps, we explained how innovation policy for future-proof living, care and welfare for the elderly could be implemented. The government would have a wide-ranging, facilitating role, providing scope for bottom-up experimentation and would itself also have to innovate.

Decision-making on radioactive waste

The government wishes to be able to use a definitive underground disposal site for radioactive waste by the year 2130. The Rathenau Instituut was asked by the State Secretary of the Ministry of Infrastructure and Water Management to advise on the decision-making process surrounding the long-term management of radioactive waste in 2024. To this end, we organised various research and dialogue activities. Further information is available on the dossier page on our website, where we also refer to previous related research, for example on geothermal energy, shale gas and carbon storage.

International lessons learned from the COVID-19 pandemic

Compilation of insights from nearly twenty countries on the impact of technology and decision-making in uncertain times

Many governments seemed inadequately prepared for the COVID-19 pandemic. They relied on ad hoc crisis management, where there was uncertainty about the impact of policy measures. This is evident from the report **Technology assessment and decision-making under uncertainty: lessons learned from the COVID-19 pandemic**. We published this report jointly with our sister organisations abroad (EPTA). These organisations, from various European countries, Japan, the United States, South Korea and Chile, shared their insights.

Policy structures should be more adaptable and dynamic. At the same time, it is very important that administration and legislation do not encroach upon citizens' rights and privacy.

During an online conference organised by the Rathenau Instituut, we reviewed the past and looked ahead to the future. In a report relating experiences in almost twenty countries, it is difficult to make recommendations or suggestions. Nevertheless, some generic challenges can be identified for the time after COVID-19. For example, the debate surrounding social, fair, inclusive and sustainable digitalisation has been pushed into the background. It is also a challenge to integrate remote working responsibly into society. In addition, countries can cooperate better to create resilient supply chains, for example for medical devices.



Under the presidency of the Rathenau Instituut, nearly 20 countries compiled their findings on what politicians, policymakers and citizens can learn about the use of technology, science and innovation in tackling the COVID-19 pandemic.

Photograph: Rinke Dohmen / Unsplash

How perfect do we want to make life?



Photograph: Astafjeva / Shutterstock

The various applications of medical biotechnology create the impression that, more than ever, life can be engineered. But what about the human side and our values? The Rathenau Instituut travelled the Netherlands holding dialogues with various groups on how perfect we want to make life. The dialogues concerned DNA modification, donor animals and artificial intelligence.

The dialogues

Talking about DNA, donor animals and artificial intelligence in healthcare

DNA of embryos only to be modified in the event of serious diseases

The Dutch are positive about modifying embryo DNA to prevent serious diseases. However, they are cautious and set clear conditions. This is shown in our report **Zo denken Nederlanders over het aanpassen van embryo-DNA**. This report is a reflection of the year 2020, when we held DNA Dialogues with the Dutch public. We spoke to different groups of people: older and younger people, students, scientists, patients, people with and without an immigrant background and with different educational backgrounds. They shared their opinions, concerns and questions with each other in community centres, theatres, classrooms, at festivals and fairs and online. The DNA Dialogue is an initiative of several organisations and was funded by the Ministry of Health, Welfare and Sport. The success of the DNA Dialogue was followed up by the Donor Animal Dialogue in the autumn of 2021.

Tips from the DNA Dialogues

"Not everyone gets to speak, but various groups share their perspective." That's tip 7 from our report **Flying Start for Dialogues**. **Tips from the DNA Dialogue.**

The report considered what we learned from the process surrounding the DNA Dialogues held in 2020 on modifying embryo DNA. Tip 7 is that groups of people with different perspectives should have their say in a public dialogue. But that does not necessarily mean as many people as possible. We want to use our findings to kick-start other, new dialogues. We ourselves are already using the tips in our Donor Animal Dialogue that started in autumn 2021.

Talking about AI for healthcare and health

Provided that privacy is properly regulated, citizens were open to the use of artificial intelligence (AI) in healthcare. This was evident from the first of the three dialogues in the series AI in healthcare, which we organised together with

other parties around AI in healthcare. In the second dialogue, we zoomed in on health apps. The participants in the discussion were willing to use an app to work on healthier behaviour, but it should not be too complicated. And if a doctor used artificial intelligence for a diagnosis, for example, the doctor would remain responsible, not the AI system. What about the data? It has to be properly protected.

Better protection of DNA data of citizens

There has to be a different view on how DNA data can be used to create social value. That was one of the conclusions of our report **Valuable use of human DNA data**. DNA data is highly sought after for conducting medical research and solving crimes. Citizens themselves are also increasingly having their DNA mapped. The interests of the players who profit from DNA are not always aligned with the interests of the people who have donated their DNA, public health or general security. DNA data of citizens is often inadequately protected and the data is not always used in a valuable way. Among other things, we wrote that laws can be amended to better protect human rights. And that the technology must be designed in such a way that the ethics are "baked-in" and the technology can be monitored.

"Herschept": a podcast about the synthetic cell

Who will soon have power over the synthetic cell? That is one of the questions the Rathenau Instituut is investigating (see also page 10). Although the synthetic cell can help create a more sustainable world, it could also lead to greater inequality. In the podcast series **Herschept** [Re-created], we worked with designer Mies Loogman. As part of the *Future Panel on Synthetic Life*, we organised dialogues between international experts from natural and social sciences, ethicists, artists and communication scientists on important social and ethical questions raised by technology. And in the Dutch consortium *Building a Synthetic Cell* (BaSyC), we have joined forces with five other research institutes for ten years. The study is intended to provide an insight into the way life works.

What does the Netherlands think about using animals as donors?

Social and political debate on bioethics with various groups

What do older people, the ex-homeless, pig farmers and schoolchildren think about using animals as donors? We asked them this during the *Donor Animal Dialogues* that the Rathenau Instituut organised jointly with NEMO Kennislink and others, starting in the autumn of 2021.

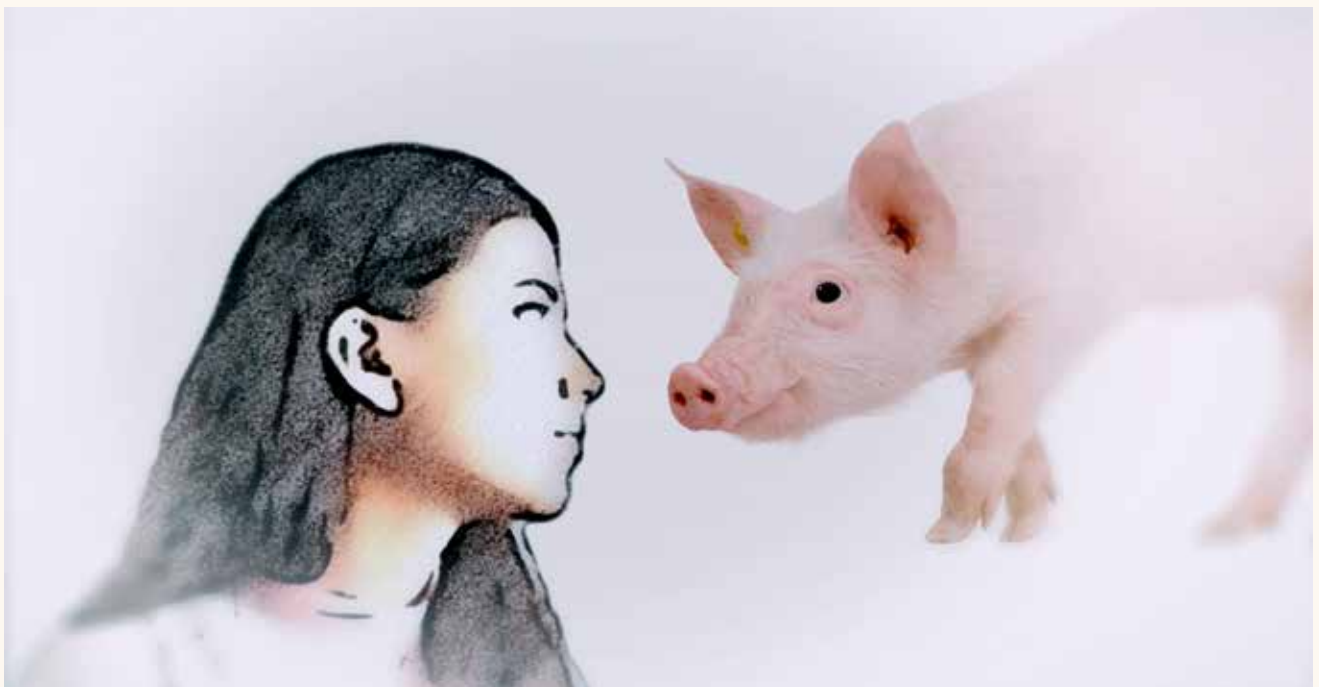
Many **final-year secondary school students we spoke to in Leeuwarden** were against using donor animals because of animal suffering and the environment. But if they themselves or their families were to fall ill, they would be more open to having a donor animal. In September, the final-year students were the first group with whom we entered into dialogue.

A month later, in early October, we were guests at the Dutch Pork Expo in the Brabanthallen in Den Bosch. More than 3,000 pig farmers, agricultural workers, veterinarians and business people attend to see what is

happening in the pig farming sector. In our discussions, we found that **visitors to the Pork Expo** were open to using animals as organ donors for humans. However, many pig farmers were reluctant to genetically modify animals. And there were concerns about long-term effects, diseases that can spread from pig to human and animal welfare.

In mid-October, we held two dialogues in Tilburg. First, we were in a community centre where we talked to older people. Most older people see benefits from using donor animals, but mainly for young people.

We then went to the Living Museum. This is a place for people with a so-called lived experience, for example in psychiatry, addiction or homelessness. The participants in the Living Museum thought that scientific development could not be stopped. We would compile our findings in early 2022.



Still from the animation we always showed at the beginning of a Donor Animal Dialogue.

Animation: Sverre Frederiksen

What are the facts and figures behind science in the Netherlands?



Photograph: Bart van Overbeeke / ANP

Dutch science performs at top level worldwide. This requires vision and money, staff and a system of knowledge institutions. To facilitate the debate on science policy, the Rathenau Instituut collects facts and figures on research and innovation in the Netherlands. We identify multi-year trends and make international comparisons. We present the figures in brief data publications and more extensive fact sheets.

Money, staff, publications, application pressure, artificial intelligence

Our data collections provide an overview and help policymakers, administrators and others

Money: a lot spent on medical sciences

Compared to other countries, Dutch higher education spends a relatively large part of its R&D budget on the medical sciences. This is shown in our fact sheet **R&D expenditure and capacity by field of science**. It is also becoming clear that countries that have a lot of manufacturing industry, such as Germany, Japan and Korea, invest more in the natural and technical sciences than countries with predominantly service-based economies, such as the Netherlands, Norway and the United Kingdom. The figures, tables and graphs in the fact sheet help policymakers make informed choices.

Staff: more than a quarter of professors are women

In 2021, the share of female professors exceeded 25% for the first time. This is shown in our fact sheet **Women in Science**. In recent years, a number of female professor appointments have been fast-tracked but this may be at the expense of the tier below them, the associate professors. Almost 50% of PhD students are now women. The proportion of university lecturers is 44%. Assistant professors (31%) and professors (26%) are lagging well behind. A large segment of the workforce will be retiring over the next few years. That may speed things up. Furthermore, one of our data publications shows that one third of Dutch authors of scientific publications are women.

The Netherlands is therefore slowly catching up with the countries which we often compare ourselves to, such as the EU countries, the US, Canada and Japan.

Employment: few unemployed PhDs

PhDs have a good position on the Dutch labour market. They are often employed in research positions outside university. And compared to other countries, the Netherlands still has few PhDs in the labour force. However, only 13% of PhD students feel that they are adequately prepared for a job outside university or a university medical centre. We summarise the facts and figures in our fact sheet **Careers for PhDs**.

Open access: international leader

71% of scientific publications involving Dutch authors were available free of charge to readers in early 2021. This makes the Netherlands an international leader, as shown in our fact sheet **Open access of research publications**. The percentage is expected to rise to 100% over the coming years. This is partly due to the fact that more and more grant makers are demanding open access.

Policy: more mission-oriented

Whereas higher education institutions conduct research into many subjects, public research institutions often specialise in one or a few research fields.

We show this in our fact sheet **The Dutch knowledge infrastructure**. And the main take-away from the fact sheet **Science policy and innovation policy** is that Dutch policy is increasingly mission-oriented.

NWO: increasing application pressure

It is costing scientists more and more time and money to apply for external funding. This is borne out by our fact sheet **Application Pressure at NWO**, which we have been updating since 2008. In many cases, the number of applications is increasing and the number of grants awarded is falling, not only in relative terms but also in absolute terms. The application pressure is especially high in the Free Competition programme (15% of the applications granted in 2020) and for the personal grants in the Innovative Research Incentives Scheme (Veni, Vidi, Vici, 15%). This is much higher with the governing bodies, at 48%.

AI: The Netherlands and Europe want to catch up in terms of investment and research

Universities and research institutes in the Netherlands pay comparatively less attention to artificial intelligence (AI) than is the case in many other countries. This is shown in our fact sheet **Research on artificial intelligence in the Netherlands**. Europe is also falling behind economic powerhouses such as China and the United States in this area.

The Netherlands and the European Union have been developing policies to promote research into artificial intelligence in recent years. For example, the EU wants governments and businesses to invest EUR 20 billion in AI annually from 2030 onwards. This is more than four times as much as in 2017. Over the next few years, we will be monitoring whether this new policy produces results.

China establishes itself as a scientific superpower

Since 1996, investment in scientific research in China has been increasing significantly more than in the Netherlands, Europe and the US. By 2019, China had the largest research capacity and the largest number of English-language scientific publications worldwide. This is shown in our fact sheet **China: a scientific superpower in the making**. Between 2010 and 2019, the number of joint publications by Dutch and Chinese scientists increased from 900 to 4,500. The growth of Chinese science provides opportunities for Dutch universities, but there are also risks.

For example, when it comes to intellectual property and human rights.

“This level of trust is very high among the Dutch” [...] “They trust science even more than, for example, the media, the judiciary and the government”.

Researcher Anne-Floor Scholvink in *De Telegraaf*, 9 October 2021, on our studies *Trust in science in the Netherlands* (2021 survey) and *Trusted Science*

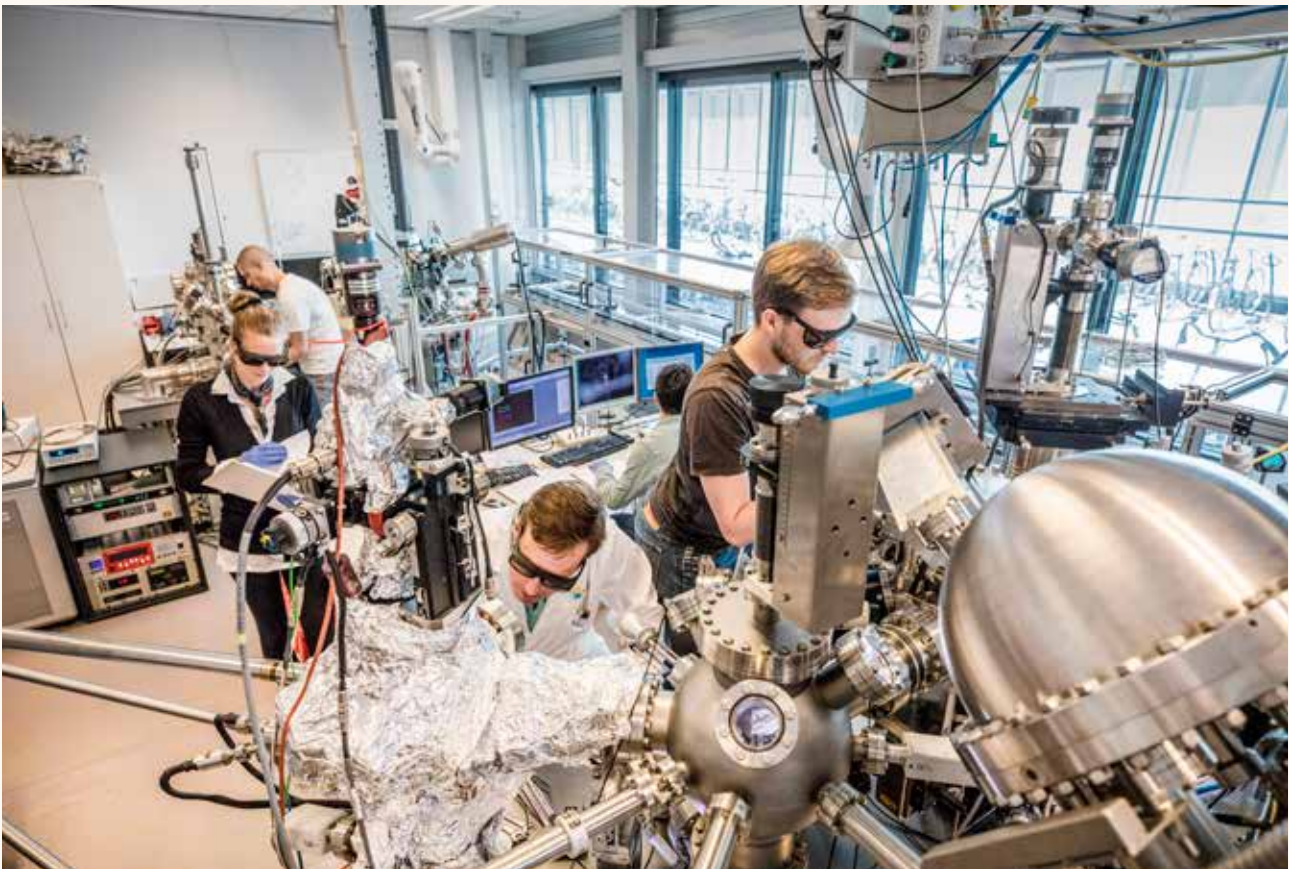
Sharp increase in public spending on R&D and innovation on the horizon

Standardised data collection ensures a clear comparison

Over the coming years, the Netherlands will be spending considerably more on R&D and innovation than in the past years. At EUR 9.2 billion, central government expenditure in 2025 is expected to be a quarter higher than in 2019 (EUR 7.3 billion), which is mainly due to the National Growth Fund. This is shown in our annual review **Total investment in science and innovation**. For this report, known as the *TWIN report*, the Rathenau Instituut collects data each year on government funding for R&D and

innovation. The data was mainly based on the budget that the government sent to the House of Representatives on Budget Day.

We also sent a questionnaire to the ministries about their investments. The way we collected the data and the definitions we used are internationally agreed. The main finding was that, even with the additional investment, the Netherlands would not be among the leaders.



Researchers at the University of Twente
Photograph: Rob Voss / ANP

Part 3

Publications

and figures

In this section you can read details of our publications in 2021 and the people and resources the Rathenau Instituut worked with.



Tablet learning at De Nieuwe Wiel primary school in Lopik
Werry Crone / ANP Foto

Reports



Eindrapport DNA-dialoog \ 25 January 2021 \ 60 pages

Full title: DNA-dialoog (2021). *Resultaten van de DNA-dialoog – Zo denken Nederlanders over het aanpassen van embryo-DNA*

→ Read the report at rathenau.nl/nl/maakbare-levens/zo-denken-nederlanders-over-het-aanpassen-van-embryo-dna



Samen verder met open science \ 23 February 2021 \ 61 pages

Full title: Rathenau Instituut (2021). *Samen verder met open science – Op weg naar betekenisvolle publieke betrokkenheid bij onderzoek* (Authors: Scholvinck, A.M., W. Scholten, P. Dieren)

→ Read the report at rathenau.nl/en/inclusive-science/moving-forward-together-with-open-science



TWIN 2019-2025 \ 20 May 2021 \ 36 pages

Full title: Rathenau Instituut (2021). *Totale Investerings in Wetenschap en Innovatie 2019-2025*. The Hague (Authors: Broek-Honingh, N.G. van den, A. Vennekens)

→ Read the report at rathenau.nl/nl/wetenschap-balans/totale-investeringen-wetenschap-en-innovatie-2019-2025



Waardevol gebruik van menselijke DNA-data \ 25 May 2021 \ 105 pages

Full title: Rathenau Instituut (2021). *Waardevol gebruik van menselijke DNA-data – Onderzoek naar het borgen van publieke waarden in de waardeketen van DNA-data*. The Hague (Authors: Willems, Y.E., Groenen, M. en Verhoef, P.)

→ Read the report at rathenau.nl/nl/maatschappelijk-en-politiek-debat-over-bio-ethiek/waardevol-gebruik-van-menselijke-dna-data



Vertrouwde wetenschap \ 8 June 2021 \ 69 pages

Full title: Rathenau Instituut (2021). *Vertrouwde wetenschap – Een kwalitatieve studie naar het publieke vertrouwen in wetenschap en opdrachtonderzoek*. The Hague (Authors: Scholvinck, A., J. Elahi, N. van den Broek-Honingh en P. Faasse)

→ Read the report at rathenau.nl/nl/wetenschap-balans/vertrouwde-wetenschap



Harmful behaviour online | 31 May 2021 | 185 pages

Full title: Rathenau Instituut (2021). *Harmful behaviour online – An investigation of harmful and immoral behaviour online in the Netherlands*. The Hague (Authors: Huijstee, M. van, W. Nieuwenhuizen, M. Sanders, E. Masson en P. van Boheemen)

→ Read the report at rathenau.nl/en/living-together-digital-world/harmful-behaviour-online



Vliegende start voor dialogen | 9 July 2021 | 29 pages

Full title: Verhoef, P., Pot, J., Grob, E., Van Woensel, M., Riedijk, S. & Gorter, E. (2021). *Vliegende start voor dialogen: Tips van de DNA-dialogoog*

→ Read the report at rathenau.nl/nl/maatschappelijk-en-politiek-debat-over-bio-ethiek/vliegende-start-voor-dialogen-tips-van-de-dna



Public trust in Science | 5 March 2021 | 35 pages

Full title: Rathenau Instituut (2021). *Trust in science in the Netherlands (2021 survey)*. The Hague (Authors: Broek-Honingh van den, N., I. Glas en A. Vennekens)

→ Read the report at rathenau.nl/en/balancing-science/trust-science-netherlands-2021-survey



Research programmes with a mission | 22 March 2021 | 69 pages

Full title: Rathenau Instituut (2021). *Research programmes with a mission - Lessons for challenge-driven innovation policy*. The Hague (Authors: Hessels, L., J. van den Broek, I. van Elzakker, L. van Drooge en J. Deuten)

→ Read the report at rathenau.nl/en/mobilising-power-innovation-meet-societal-challenges/research-programmes-with-a-mission



EU-missies voor maatschappelijke opgaven | 3 September 2021 | 98 pages

Full title: Rathenau Instituut (2021). *EU-missies voor maatschappelijke opgaven – Inspiratie uit Horizon Europe voor opgegevericht innovatiebeleid*. The Hague (Authors: Geurts, A., S.-Y. Tjong Tjin Tai, L. Hessels en J. Deuten)

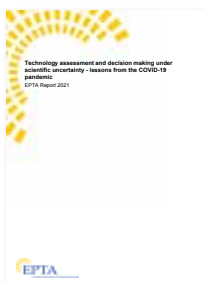
→ Read the report at rathenau.nl/nl/innovatiekracht-inzetten-voor-maatschappelijke-opgaven/eu-missies-voor-maatschappelijke-opgaven



De stand van digitaal Nederland | 20 September 2021 | 60 pages

Full title: Rathenau Instituut (2021). *De stand van digitaal Nederland. Naar zeggenschap en vertrouwen in de digitale samenleving*. The Hague (Authors: Kool, L., J. Hamer, P. van Boheemen, R. Dekker, J. Deuten, R. van Est, M. van Huijstee, R. de Jong, B. Karstens, E. Masson, en P. Verhoef)

→ Read the report at rathenau.nl/nl/digitale-samenleving/de-stand-van-digitaal-nederland



The COVID-19 pandemic: drawing lessons to strengthen societies | 9 November 2021 | 129 pages

Full title: *Technology assessment and decision making under scientific uncertainty - lessons from the COVID-19 pandemic*

→ Read the report at rathenau.nl/en/covid-19-pandemic-drawing-lessons-strengthen-societies



Tussen uitvinding en uitdaging | 23 november 2021 | 62 pages

Full title: Rathenau Instituut (2021). *Tussen uitvinding en uitdaging – Over de relatie tussen universiteiten, start-ups en de samenleving*. The Hague (Authors: Rijnsoever, F. van, T. de Boer en J. Deuten)

→ Read the report at rathenau.nl/nl/innovatiekracht-inzetten-voor-maatschappelijke-opgaven/tussen-uitvinding-en-uitdaging

Other publications

Killer robots. Waarom internationale afspraken nodig zijn

4 January 2021, Article

Towards healthy data use for medical research

4 January 2021, Article

Towards proper management of data technology in healthcare

11 January 2021, Article

Kennisveiligheid in hoger onderwijs en wetenschap

11 January 2021, Message to Parliament

Technologisch burgerschap als wapen tegen misleidende informatie

14 January 2021, Article

Innovating with AI in healthcare: "Get the data in order first"

18 January 2021, Article

België ontwaakt uit de technologische droom

19 January 2021, Article

Zo denken Nederlanders over het aanpassen van embryo-DNA

25 January 2021, Article

Spraaktechnologie is meer dan een interface

29 January 2021, Article

Speech technology is more than just an interface

29 January 2021, Article

The corona crisis calls for careful action and democratic debate

1 February 2021, Message to Parliament

Praktijkgericht onderzoek hogescholen

3 February 2021, Factsheet

Artificial intelligence in healthcare: deciding together is crucial

3 February 2021, Article

Waterstof: rockster van de duurzame economie?

5 February 2021, Article

Wat betekent het voorzorgsprincipe voor jou?

9 February 2021, Article

Het aandeel vrouwelijke auteurs van wetenschappelijke publicaties

11 February 2021, Datapublicatie

How Artificial Intelligence can support the practice of doctors

16 February 2021, Article

Burgers bij wetenschap betrekken kan beter

23 February 2021, Article

Hoe kunstmatige intelligentie artsen in de praktijk kan ondersteunen

24 February 2021, Article

Solidariteit en eerlijke verdeling van vaccins

26 February 2021, Article

Reactie op AIV-advies Regulering van online content

1 March 2021, Article

Het voorzorgsprincipe en digitale beslissings-ondersteunende systemen in de zorg

1 March 2021, Article

Europa als koploper voor wetgeving en standaardisering wereldwijde AI

3 March 2021, Article

In 35 jaar kan veel veranderen

4 March 2021, Article

Kan technologie de maatschappelijke positie van de vrouw verbeteren?

8 March 2021, Article

Het aandeel vrouwelijke auteurs van wetenschappelijke publicaties

8 March 2021, Data publication

Energietransitie vraagt om nieuwe energiewetgeving

9 March 2021, Article

Alleen het aanpakken van de marktpositie is onvoldoende

11 March 2021, Article

Dutch debate on 5G needs more substance

11 March 2021, Message to Parliament

Meer transparantie nodig over microtargeting bij online politieke advertenties

11 March 2021, Article

Leren digitaliseren (6) Open de wetenschap onder goede voorwaarden

12 March 2021, Article

Zoektocht naar verantwoordelijkheid

15 March 2021, Article

The precautionary principle and clinical decision support systems in healthcare

15 March 2021, Article

Verbied gezichtsherkenning op straat en in parken

16 March 2021, Article

Fragmentatie van het publieke debat is een gevaar voor de democratie

16 March 2021, Article

A lot can change in 35 years

16 March 2021, Article

Encryptie verzwakken is onverstandig. Niet doen dus

17 March 2021, Article

Publieke waarden en digitalisering

19 March 2021, Article

Het voorzorgsprincipe en de ontwikkeling van gene-drive-technologie

23 March 2021, Article

Zeven overwegingen voor de discussie over een coronapaspoort

25 March 2021, Message to Parliament

Balans van de wetenschap (1) "Gelet op de ambities staat Nederland er goed voor"

26 March 2021, Article

Vraag het de wetenschapper: de gevolgen van nepnieuws met Melanie Peters

1 April 2021, Review

Balans van de wetenschap (2) "Maatschappelijke rol moet beter gewaardeerd worden"

6 April 2021, Article

The precautionary principle and the development of gene drive technology

8 April 2021, Article

Onderzoeksevaluaties worstelen met maatschappelijke waarde

13 April 2021, Article

Nieuw kabinet: kom met een visie voor een toekomstbestendige digitale infrastructuur

16 April 2021, Article

Balans van de wetenschap (3) "De regio moet altijd om aandacht roepen"

20 April 2021, Article

Jaarverslag 2020

21 April 2021, News

Maatschappelijk debat over VR

30 April 2021, Review

Dialogoog over het dier als donor

13 May 2021, Article

Belgium awakens from the technological dream

17 May 2021, Article

Grip op algoritmische besluitvorming bij de overheid. De rol van de Eerste Kamer

18 May 2021, Article

Forse stijging verwacht van overheidsuitgaven voor R&D en innovatie

20 May 2021, Facts and figures

De toekomst van online platformen

20 May 2021, Message to Parliament

Grip op de digitale samenleving van morgen

21 May 2021, Message to Parliament

Burgers beter beschermen in de keten van DNA-data

25 May 2021, Article

Doe mee aan het onderzoek: Drijfveren van onderzoekers en docenten

31 May 2021, Survey

Hoe beïnvloedt de coronacrisis onderzoekers?

31 May 2021, Article

Researcher and teacher motivation survey

31 May 2021, Survey

Balans van de wetenschap (4) "We werken allemaal naar een burn-out toe"

2 June 2021, Article

De rol van kennis bij de bevingen in Groningen

4 June 2021, Article

"Beleidsexperimenten zijn belangrijk voor gecontroleerde en transparante AI-systemen"

5 June 2021, Article

"Policy experiments are important to provide controlled and transparent AI systems"

5 June 2021, Article

Internationale mobiliteit van AI-wetenschappers

7 June 2021, Fact sheet

Onze buitenlandse partners: Technologirådet

7 June 2021, Article

Our foreign partners: Technologirådet

7 June 2021, Article

Als wetenschap politiek wordt, daalt het vertrouwen van burgers

8 June 2021, Article

Annual Report 2020

8 June 2021, News

Maria Henneman nieuwe voorzitter van het bestuur van het Rathenau Instituut

14 June 2021, News

Maria Henneman new chair of the board of the Rathenau Instituut

14 June 2021, News

Edwin Pos uitgeroepen tot Wetenschapstalent 2021

14 June 2021, Review

We zijn jarig!

17 June 2021, Article

Het Rathenau Instituut bezoekt de commissie voor Sociale Zaken en Werkgelegenheid

18 June 2021, News

Balans van de wetenschap (5) "Bewust worden van biases is niet altijd comfortabel"

21 June 2021, Article

Herschept: een podcast over de synthetische cel

23 June 2021, Article

AI voor zorg en gezondheid: in gesprek met burgers en patiënten

25 June 2021, Article

Onze buitenlandse partners: TAB

30 June 2021, Article

Our partners abroad: TAB

30 June 2021, Article

"Mixed Reality": een kookshow met digitale ingrediënten

30 June 2021, Article

Onderzoek naar kunstmatige intelligentie in Nederland

1 July 2021, Fact sheet

Nederland en Europa verliezen terrein bij onderzoek naar kunstmatige intelligentie

1 July 2021, Article

Praktijkgericht onderzoek: wat hogescholen kunnen leren van beleidsgerichte kennisorganisaties

5 July 2021, Article

Rathenau Instituut luidt noodklok over schadelijk en immoreel gedrag online

7 July 2021, Article

Vertrouwen van Nederlanders in de wetenschap stijgt

8 July 2021, Article

"Mondiale UNESCO aanbeveling over ethiek van AI zeker niet vrijblijvend"

13 July 2021, Article

De opkomst van China als R&D-supermacht

15 July 2021, Fact sheet

China vestigt zich als R&D-supermacht

15 July 2021, Article

Lessen over Living Labs gebundeld

20 July 2021, Article

Meer tijd voor onderzoekers en docenten om deel te nemen aan het drijfverenonderzoek

22 July 2021, News

"De betrouwbaarheid van AI is bovenal een sociaal-technisch concept"

26 July 2021, Article

'Trustworthiness of AI is mainly a socio-technical concept'

26 July 2021, Article

Publieke waarden en het gebruik van genetische gegevens

29 July 2021, Article

"Data zijn het nieuwe plastic"

30 July 2021, News

Een pleidooi voor voorzorg, juist tijdens crises

3 August 2021, Article

"Kabinet: stop met het overschatten van de kansen van digitalisering"

5 August 2021, Article

In Memoriam Melanie Peters

16 August 2021, News

In Memoriam Melanie Peters

18 August 2021, News

Laurens Hessels wordt hoogleraar Maatschappelijke waarde van wetenschap

3 September 2021, Article

Laurens Hessels to be Professor of the Societal Value of Science

3 September 2021, Article

Maatschappelijke opgaven vragen om een nieuw soort onderzoeksprogramma's

3 September 2021, Article

De Green Deal: grote ambitie zonder grote omwenteling

6 September 2021, Article

Zeven aandachtspunten voor de AI-verordening

10 September 2021, Message to Parliament

De toekomst van online platformen (2)

13 September 2021, Message to Parliament

Bekijk aflevering 1 van de kookshow "Mixed Reality"

14 September 2021, Article

Deepfakes zijn niet meer te stoppen, maar we kunnen ons er wel tegen wapenen

16 September 2021, Article

Burgers: meer zeggenschap en kennis nodig over dataverzameling

17 September 2021, Article

"Nieuw kabinet, toon daadkracht voor waardevolle digitale innovatie"

20 September 2021, Article

"Mixed Reality" (2): zien en gezien worden

21 September 2021, Article

The Green Deal: great ambition without major transition

21 September 2021, Article

The DNA-dialogue: analysis and outcomes

23 September 2021, Article

"Mixed Reality" (3): data, manipulatie, macht

28 September 2021, Article

Digitaal democratisch, maar hoe?

28 September 2021, Article

Dossier Advies Besluitvormingsproces toekomst radioactief afval

29 September 2021, Dossier

Europese conceptwet rond AI biedt houvast voor beheer van elektriciteitsnetten

29 September 2021, Article

Henk de Jong interim-directeur Rathenau Instituut

1 October 2021, News

Rathenau Instituut welcomes interim director Henk de Jong

1 October 2021, News

Toekomst open science nog ongewis, maar EU kan zich wel voorbereiden

1 October 2021, Article

Start-ups met idealen verdienen extra aandacht

8 October 2021, Article

Internationale lessen van de coronapandemie voor sterkere samenlevingen

12 October 2021, Article

The COVID-19 pandemic: drawing lessons to strengthen societies

12 October 2021, Article

Episode 1 of "Herschept", a podcast about the synthetic cell

13 October 2021, Article

Three-part podcast series "Herschept - wanneer de mens leven nabouwt in het lab"

13 October 2021, News

We moeten leren leven met deepfakes

14 October 2021, Article

Dan gooi ik toch gewoon 10.000 medische dossiers door een algoritme?

18 October 2021, Article

Corona en de noodzaak van waardevol digitaliseren

19 October 2021, Article

Oud maar niet vergeten

19 October 2021, Message to Parliament

Episode 2 of "Herschept", a podcast about the synthetic cell

26 October 2021, Article

Bijna driekwart Nederlandse onderzoek gratis toegankelijk

27 October 2021, Article

Kennisinstellingen richten netwerk op rond evaluatie maatschappelijke impact

28 October 2021, News

In gesprek tijdens de Dutch Design Week

29 October 2021, Review

Wat vinden 6-vwo'ers van dieren als donor?

1 November 2021, Review

Het vertrouwen in de wetenschap is hoog, maar niet onvoorwaardelijk

5 November 2021, Article

Deskundigen in de Eerste Kamer over AI bij overheidsbesluitvorming

5 November 2021, Review

Internationale lessen van de coronacrisis: hoe maken we samenlevingen sterker?

9 November 2021, Article

International lessons to be learned from the COVID-19 pandemic: how do we make societies more resilient?

9 November 2021, Article

Episode 3 of "Herschept", a podcast about the synthetic cell

10 November 2021, Article

Desinformatie: een voorbeeld van online schadelijk en immoreel gedrag

11 November 2021, Case

Petra Verhoef in Vlaams denkersprogramma duurzame innovatie

11 November 2021, News

Kool en Hamer over digitale samenleving bij Immersive Tech Week

11 November 2021, News

Onze buitenlandse partners (3): het Portugese observatorium OAT

12 November 2021, Article

Our partners abroad (3): The Portuguese observatory OAT

12 November 2021, Article

We denken te snel dat een meekijkende computer het beter kan

15 November 2021, Article

Verstoord eetgedrag: een voorbeeld van online schadelijk en immoreel gedrag

17 November 2021, Case

De metaverse maakt het gesprek over de digitale samenleving nog urgenter

17 November 2021, Article

Onze buitenlandse partners (4): TA-SWISS

18 November 2021, Article

Our partners abroad (4): TA-SWISS

18 November 2021, Article

Volop kansen om innovatie voor maatschappelijke uitdagingen te versterken

23 November 2021, Article

Wat vinden varkenshouders van dieren als donor?

24 November 2021, Review

Voorbij privacy en veiligheid in het onderwijs

24 November 2021, Message to Parliament

Online shaming: een voorbeeld van online schadelijk en immoreel gedrag

25 November 2021, Case

Wat vinden Tilburgers van het dier als donor?

26 November 2021, Review

Benaderingen coronapandemie staan centraal op EPTA-conferentie

30 November 2021, Review

EPTA Conference: Lessons learned from the COVID-19 Pandemic

30 November 2021, Review

Onze buitenlandse partners (5): Spiral uit Wallonië

9 December 2021, Article

Our foreign partners (5): Spiral from Wallonia

9 December 2021, Article

Missiegedreven energietransitie laat sectoren samenwerken, maar innovaties inpassen in samenleving kan beter

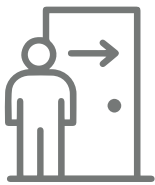
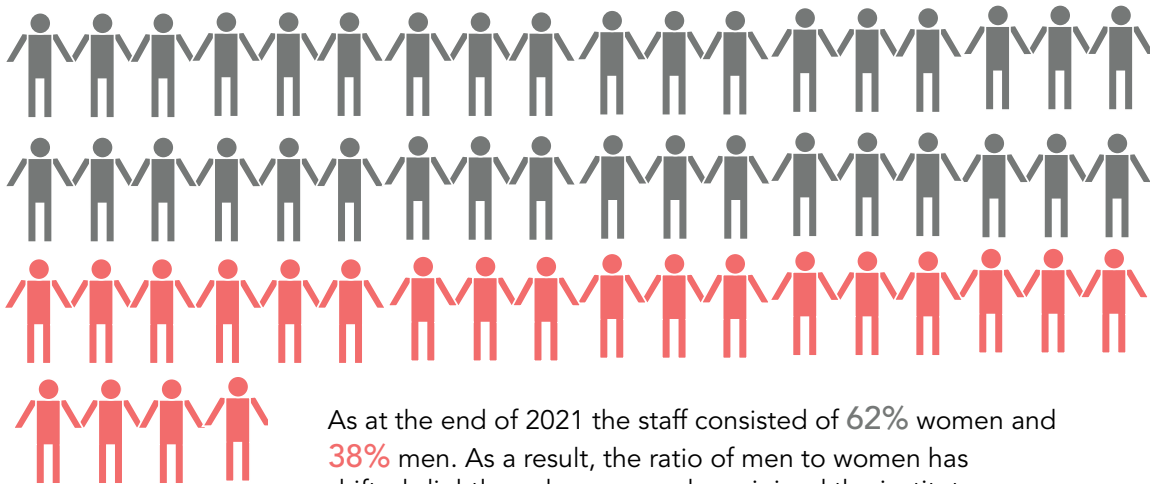
13 December 2021, Article

Goede loopbaankansen na een PhD

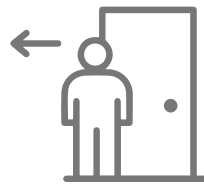
14 December 2021, Article

Staff

On 31 December 2021 **58** people (49.81 FTEs) were employed. By the end of 2020, there were 60 (52.20 FTEs).



14 employees left the institute in 2021.



In 2021, **13** new employees were hired.



At the end of 2021, **53%** of employees were employed on a permanent basis, compared to 52% at the end of 2020.

In 2021, **11** interns from different universities completed their internship with us.



The percentage of employees under 40 years of age was **50%** in 2021 (52% in 2020).

The absence rate was **2,81%**. In 2020, the first year of COVID-19, it was particularly low at 1.90%.

Finances

Income in 2021

In 2021, the Rathenau Instituut generated an income of EUR 5,532k, EUR 78k higher than budgeted. EUR 4,697k was received from the Ministry of Education, Culture and Science, via the Academy, as core funding. In addition to the core funding, projects were carried out with third-party funding. These projects met the institute's requirements, such as being able to publish and substantively connect to the Work Programme and

tasks from the Decree establishing the institute.

In 2021, the institute received EUR 832k in external funding, EUR 32k higher than budgeted. This covered 24 projects with funding from Europe H2020, ministries, NWO and other organisations. The Rathenau Instituut aims to achieve a maximum of 20% funding by external clients on top of the core funding. In 2021 that figure stood at 18%. This is higher than in 2020.

Income (EUR 1,000)	Actual	Budget	Difference
Contribution from the Ministry of Education, Culture and Science	4,697	4,639	58
External funding	832	80	32
Other revenue	3	15	-12
Total income	5,532	5,454	78

Year (EUR 1,000)	2017	2018	2019	2020	2021
Total income	4,807	5,166	5,270	5,401	5,532
Total Ministry contribution	4,241	4,346	4,519	4,639	4,697
External funding	525	783	703	756	832
External funding compared to Ministry contribution	12%	18%	16%	16%	18%

Expenses 2021

Total expenses amounted to EUR 5,552k. This is (- EUR 278k) less than envisaged when the budget was drafted. Staff costs were lower (- EUR 44k). Furthermore, material

costs were lower (- EUR 83k) and the projects were implemented at lower cost (- EUR 151k) mainly due to COVID-19.

Expenses (EUR 1,000)	Actual	Budget	Difference
Staff costs	4,667	4,711	-44
Project costs	314	465	-151
Material costs	571	654	-83
Total expenses	5,552	5,830	-278

N.B. The Rathenau Instituut's annual accounts are consolidated in the annual accounts of the Royal Netherlands Academy of Arts and Sciences and as such form part of the Academy's annual report.

Board

Until 1 April 2021

Gerdi Verbeet (chair) \ Supervisory director at Novamedia and other organisations.

Since 1 June 2021

Maria Henneman (chair) \ Owner of consultancy firm Henneman Strategies. She also holds a number of additional positions, including at the Dutch Safety Board and at ZonMw.

Prof. Noelle Aarts \ Director of the Institute for Science in Society (ISiS) at Radboud University and Professor of Socio-Ecological Interactions.

Felix Cohen \ Chair of the Supervisory Board of Regina Coeli and Chair of the Central Client Council of Haagse Wijk- en Woonzorg (HWW care).

Dr Laurence Guérin \ Lecturer in World Citizenship at The Hague University of Applied Sciences and practising lecturer in Citizenship at ROC van Twente.

Dr Janneke Hoekstra MSc \ Chair of the Supervisory Board of welfare organisation Rijnstad and owner of a consultancy firm.

Prof. Erwin Muller \ Dean of the Faculty of Governance and Global Affairs and Director of the Campus The Hague of Leiden University and Professor of Security and Law at the same university.

Prof. Peter-Paul Verbeek \ Professor of Philosophy of Man and Technology and scientific co-director of the DesignLab at the University of Twente, honorary professor of Techno-Anthropology at the University of Aalborg (Denmark) and member of the Academy, among others.

Rajash Rawal \ Member of the Board of Governors of The Hague University of Applied Sciences.

Until 11 August 2021

Dr Melanie Peters (secretary) \ Director Rathenau Instituut.

Since 11 October 2021

Henk de Jong (secretary) \ Director Rathenau Instituut and director of PBLQ consultancy.

Programme Council

Until 1 April 2021

Gerdi Verbeet (chair) is a supervisory director at Novamedia and other organisations.

Since 1 June 2021

Maria Henneman (chair) is the owner of the consulting firm Henneman Strategies. She also holds a number of additional positions, including at the Dutch Safety Board and at ZonMw.

Annet Aris MBA teaches digital strategy at INSEAD Business School in France and is a supervisory board member of several companies.

Marien Baerveldt is a strategic advisor in the field of learning, development and change and provides leadership training for civil society organisations.

Dr Rob Bijl was deputy director of the Netherlands Institute for Social Research (SCP).

Kris Douma is chair of the board of the Netherlands Institute of Chartered Accountants (NBA) and a supervisory director at the insurance company NV Schade, the Stichting Register Arbeidsdeskundigen (SRA) and Oxfam Novib.

Dr Linda Duits is a researcher, publicist and lecturer in Media Studies and Gender Studies at Utrecht University.

Bas Eickhout is a member of the European Parliament on behalf of the Greens/EFA Group and leader of the GroenLinks Europa delegation.

Bert Fokkema works for Shell in an international team that develops policy and internal standards for the decommissioning of oil and gas production facilities.

Yuri van Geest is co-author of the bestseller Exponential Organisations and co-founder of De Buitenboordmotor.

Peter Giesen is editor abroad and commentator for de Volkskrant daily newspaper.

Prof. Rob J. Hamer is director/owner of Hademar Holding B.V., a company specialising in sustainable innovation.

Rob van Hattum is a programme maker at Tegenlicht, science editor for the VPRO and Chief Technology Officer at NEMO.

Jos de Jonge was coordinator of the Information Function at the Rathenau Instituut. The collection and analysis of facts and figures about science was central to this.

Yori Kamphuis is Senior Consultant AI and Cybersecurity at TNO and speaker on artificial intelligence.

Dr Annette Klinkert is founder of the company city2science.

Carrie van der Kroon is a specialised lawyer in international children's rights. She works internationally as a fund-raiser, programme coordinator, lobbyist and podcast presenter for Defence for Children - ECPAT Netherlands.

Chris Kuijpers is Director-General of Administration and Housing at the Ministry of the Interior and Kingdom Relations.

Willem Lageweg is director/quartermaster of the Transition Coalition Food and holds executive and supervisory positions at Triodos Bank, Max Havelaar, Louis Bolk and Institute Positive Health.

Dr René von Schomberg is a philosopher and specialist in science and technology studies, working for the European Commission and visiting professor at the Technical University of Darmstadt.

Dr Jeanine van de Wiel is Group Lead Global Regulatory Affairs at DSM Food Specialties.

David Winickoff is a senior policy analyst at the Organisation for Economic Co-operation and Development (OECD) and Professor of Law at Sciences Po Law School.

Lynn Zebeda is a social entrepreneur, a supervisor at Fair Trade and MVO Nederland and a board member of the Solar Biennial and the Church of Climate Change.

Until 11 August 2021

Dr Melanie Peters (secretary) was director of the Rathenau Instituut.

Since 11 October 2021

Henk de Jong (secretary) is director of the Rathenau Instituut and director of the consultancy PBLQ.

The Rathenau Instituut supports the formation of public and political opinion on the socially relevant aspects of science and technology. It conducts research and organises discussion of science, innovation, and new technologies.

[**www.rathenau.nl**](http://www.rathenau.nl)

Rathenau Instituut