2022 Royal Netherlands Academy of Arts and Science (KNAW)

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Cover: istockphotos

This publication can be cited as follows: KNAW (2022). The pandemic academic. How COVID-19 has impacted the research community, Amsterdam.
THE PANDEMIC ACADEMIC

HOW COVID-19 HAS IMPACTED THE RESEARCH COMMUNITY
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On 11 March 2020, the World Health Organisation announced that the worldwide outbreak of COVID-19 could be characterized as a pandemic.¹ It was not long before we all experienced its transformative impact on our everyday lives, and on aspects of our academic lives. Now, as the dust settles after two turbulent years, it may seem tempting to rush back to the ‘old normal’. But the pandemic has made clear that certain facets of the old normal need to change. Now is the time to reflect on which changes we wish to embrace and how we can mitigate the negative consequences.

As the voice of the arts and sciences in the Netherlands, the Royal Netherlands Academy of Arts and Sciences has the worthy task of emphasizing the role and importance of science and scholarship and of ensuring that they function optimally. The pandemic added urgency and relevance to this task, as it underscored the pivotal role of academia in society, increased the public visibility of academic research and academics, rapidly changed academic research practices and impacted scholars’ careers, lives and wellbeing. Although the impact of the pandemic on academia was not as far-reaching as the unprecedented social, economic and health consequences for society as a whole, we nevertheless consider it our obligation to analyse it effects on the academic community.

I would like to thank the members of the committee for taking up this task and for the enthusiasm and thoroughness with which they produced this report. Their achievement is especially laudable because the advisory procedure took place in a hectic period in which they themselves were facing COVID-related challenges.

I hope this report inspires academic institutions, policymakers and funding agencies to take a forward-looking approach, and I expect that it will help to map out the road to an ‘improved normal’, where solutions will be found for existing divides in academia that the pandemic has brought to the fore. In line with one of the strategic priorities of our Academy, I specifically call for actions that will improve the position of early-career researchers so as to make our academic system future-proof.

Marileen Dogterom
President of the Royal Netherland Academy of Arts and Sciences (KNAW)
Since the start of the COVID-19 pandemic, the academic research community has played a crucial role in generating the knowledge needed to overcome this crisis. The pandemic’s unprecedented impact on the academic research community itself has so far been largely ignored, however. This report sheds light on how the COVID-19 pandemic has impacted, and continues to impact, the academic community by affecting scholars, academic research practices and trust in academia in both negative and positive ways.

The report covers a wide range of topics, which all have in common that they have been influenced or raised by the pandemic. To avoid widening the remit of the report any further, we focus specifically on academic research. This is purely a matter of scoping and is not meant to downplay the devastating impact of the pandemic on, for example, higher education, traditional educational practices, students and teachers.

The COVID-19 pandemic has been a pressure cooker for the academic research community, giving rise to both unprecedented opportunities and major challenges. For example, many academic researchers have faced a heavier academic workload owing to the immediate challenges of online teaching and management, while simultaneously struggling to work from home. Most researchers have experienced abrupt disruptions of ongoing research projects, while at the same time we have seen a swift initiation of new worldwide research collaborations and COVID-related research projects. In addition, the pandemic has positioned researchers more prominently in the public arena, accelerated digitalization, and boosted growing awareness of the ecological footprint of the academic ‘travelling circus’.
As has been the case in many other professions, then, the coronavirus pandemic stirred up the research community. If we wish to keep building the momentum for positive change and mitigate the negative consequences, now is the time to take stock and spring into action. We must not return to the ‘old normal’ but reflect on, and implement, the lessons we have learned as academics in the pandemic. These lessons concern three overarching topics, discussed in separate chapters.

**Trust and trustworthiness**

Chapter 2, addressing ‘the impact of the COVID-19 pandemic on trust in academic research’, considers some of the challenges and pitfalls associated with academic researchers’ greater public visibility and the current momentum for defining and reinforcing the role of academia in society, while being mindful of the apparent change in public trust in (and the politicization of) scholarly knowledge. The pandemic exemplified the need to invest in transparency and good communication with the public. Not every academic researcher needs to be an expert in public engagement, but to build trustworthiness, researchers must be aware of their own position and epistemic expertise, open about their values, open to information reaching them from outside their ‘bubble’, and willing to change their views in the light of new evidence. Importantly, science must not only get the space to show vulnerability, but it must also be resilient. At the same time, action is needed to protect academics from public hostility. This hostility, if it causes scholars to withdraw from public engagement and knowledge-sharing, threatens academic freedom.

**Impact on scholars**

How the pandemic impacted the work and the personal lives of scholars is discussed in chapter 3. The direct and indirect effects of the pandemic vary greatly between researchers in different disciplines, depending, among other things, on their care duties, gender, career stage, digital literacy, teaching, patient care, and leadership responsibilities, background, and institutional embedding. The pandemic hit the various segments of the academic research community in different, and unequal ways, and this inequality merits particular attention and urgent action to avoid a ‘lost generation’.

Although the academic research community is often described as extremely competitive, the pandemic highlighted the importance of collaboration, mutual support, solidarity and altruism in academia as the bedrock of successful and resilient organizations. This requires a more professional and supportive HR strategy as integral to every academic institution.
Academic practices: acceleration and digitalization

The pandemic drastically changed existing work processes and academic practices. In Chapter 4, we reflect on what is needed to maintain the accelerated pace of scholarly progress while remaining true to the values of academic research and mindful of the unpredictable benefits of basic, curiosity-driven research.

Due to the rapid acceleration of digitalization, we are moving towards more hybrid modes of working and new perspectives on internationalization, collaboration and conferencing, with positive effects on inclusiveness. However, we urgently need to consider academia’s growing dependence on Big Tech and push for the development of alternative digital infrastructures and independent tools and/or procurement guidelines for Big Tech that reflect and respect academic values.

Recommendations

In Chapter 5, we summarize the lessons learned and make recommendations for a forward-looking approach. We distinguish between topics that have been directly impacted by the pandemic and broader topics, where transitions have already been underway and the crisis has merely highlighted their importance. We call for the establishment of organizational post-COVID teams that will continue monitoring the mid-term and long-term impacts of the pandemic, successful mitigation measures, and encroaching changes on researchers, academic careers, research practices and the academic community as a whole.

The pandemic acted as a magnifying glass, allowing us to better see existing cracks in the research community. Let’s us now take the opportunity to repair these cracks.
Sinds het begin van de COVID-19-pandemie heeft de wetenschap een cruciale rol gespeeld bij het genereren van de benodigde kennis om deze crisis het hoofd te bieden. De gevolgen van de pandemie voor wetenschappers en de wetenschap zelf hebben tot dusver echter weinig aandacht gekregen. Dit rapport belicht de impact die de COVID-19-pandemie heeft (gehad) op de academische gemeenschap vanwege de negatieve én positieve gevolgen voor wetenschappers, wetenschapsbeoefening en het vertrouwen in de wetenschap.

Het rapport gaat in op heel diverse onderwerpen, die gemeen hebben dat ze sterk door de pandemie zijn beïnvloed of erdoor aan het licht zijn gekomen. Om de reikwijdte toch enigszins te beperken, is het rapport specifiek gericht op wetenschappelijk onderzoek. Dit is puur een kwestie van afbakening. Daarmee willen we de enorme impact van de pandemie op bijvoorbeeld het hoger onderwijs, de onderwijspraktijk, studenten en docenten absoluut niet bagatelliseren.

Voor de academische onderzoeksgemeenschap is de COVID-19-pandemie een soort snelkookpan geweest, met enerzijds enorme kansen en anderzijds grote uitdagingen. Zo kregen veel wetenschappers, behalve met de strubbelingen van het thuiswerken, te maken met een hogere werklast door de plotselinge omschakeling naar online les en leiding geven. De meeste wetenschappers kregen te maken met abrupte onderbrekingen van lopende onderzoeksprojecten. Tegelijkertijd werden er in hoog tempo nieuwe wereldwijde onderzoekssamenwerkingen en corona-gerelateerde projecten opgezet. Daarnaast zorgde de pandemie voor een prominente rol van de wetenschap in het publieke domein, voor een enorme versnelling van de digitalisatie én kreeg het groeiende bewustzijn rond de ecologische voetafdruk als gevolg van het wetenschappelijke ‘rondreizende circus’ een boost.
De coronacrisis heeft dus flink wat teweeggebracht in de wetenschap (net als in veel andere sectoren). Als we het huidige momentum voor positieve verandering willen benutten en de negatieve gevolgen willen beperken, is het nu tijd om de balans op te maken en tot actie over te gaan. We moeten niet willen terugkeren naar ‘het oude normaal’, maar reflecteren op wat we hebben geleerd als wetenschappers in de pandemie, en dit vervolgens implementeren. Hierbij kijken we naar drie overkoepelende thema’s die in aparte hoofdstukken aan de orde komen.

**Vertrouwen en betrouwbaarheid**

Hoofdstuk 2 gaat over de impact van de COVID-19-pandemie op het vertrouwen in wetenschappelijk onderzoek. Welke uitdagingen en valkuilen brengt de grotere zichtbaarheid van het wetenschappelijke onderzoek met zich mee? En hoe kunnen we het momentum voor het definiëren en versterken van de maatschappelijke rol van de wetenschap gebruiken, zonder daarbij de ogenschijnlijke verandering in het vertrouwen van het publiek in (en de politisering van) wetenschappelijke kennis uit het oog te verliezen? De pandemie heeft duidelijk gemaakt dat er moet worden geïnvesteerd in transparantie en goede communicatie met het publiek. Niet elke wetenschapper hoeft een expert te worden in publiekscommunicatie, maar bewustzijn van de eigen positie en epistemische expertise, alsmede een open houding ten aanzien van de eigen waarden, van informatie die van buiten de eigen ‘bubbel’ komt en bijstelling van standpunten in het licht van nieuw bewijs, zijn cruciaal voor de betrouwbaarheid van de wetenschap. Het is belangrijk dat de wetenschap de ruimte heeft om zich kwetsbaar op te stellen, én dat zij veerkrachtig is. Daarnaast is actie vereist om wetenschappers te beschermen tegen vijandigheid vanuit het publiek. Wanneer die vijandigheid ertoe leidt dat wetenschappers zich terugtrekken uit het publieke domein en niet langer hun kennis delen vormt dit een bedreiging voor de wetenschappelijke vrijheid.

**Impact op wetenschappers**

De impact van de pandemie op het werk- en het privéleven van wetenschappers komt aan bod in hoofdstuk 3. De directe en indirecte effecten van de pandemie blijken sterk te verschillen tussen wetenschappers uit verschillende disciplines, en onder meer af te hangen van zorgtaken, gender, carrièrefase, digitale vaardigheden, onderwijs-, patiëntenzorg- en leidinggevende taken, achtergrond en institutionele inbedding. Het is belangrijk dat er aandacht is voor de grote ongelijkheid in de manieren waarop wetenschappers getroffen werden door de pandemie. Als op dit punt niet snel maatregelen worden genomen, bestaat het gevaar dat er een verloren generatie ontstaat.
Hoewel de academische onderzoeksgemeenschap vaak te boek staat als erg competitief, heeft de pandemie ook laten zien hoe groot het belang van samenwerking, onderlinge steun, solidariteit en altruïsme in de wetenschap is. Deze elementen liggen aan de basis van succesvolle en veerkrachtige organisaties. Een professionelere en meer ondersteunende HR-strategie als integraal onderdeel van wetenschappelijke instellingen is daarvoor onmisbaar.

**Wetenschapsbeoefening: versnelling en digitalisatie**

De pandemie heeft de bestaande werkprocessen en de wetenschappelijke praktijk ingrijpend veranderd. In hoofdstuk 4 gaan we in op de vraag wat er nodig is om snelheid in wetenschapsbeoefening te stimuleren, en daarbij trouw te blijven aan de waarden van het wetenschappelijk onderzoek en oog te blijven houden voor het onvoorspelbare nut van fundamenteel, nieuwsgierigheid gedreven onderzoek.

Doordat de digitalisatie van de wetenschap in een stroomversnelling is gekomen verandert onze manier van werken en onze kijk op internationalisering, samenwerking en congresbezoek. Dit heeft een positieve invloed op inclusiviteit. Daarbij dringt zich echter de vraag op hoe de wetenschap moet omgaan met de groeiende afhankelijkheid van Big Tech. We dringen er daarom sterk op aan dat er alternatieve digitale infrastructuren en onafhankelijke instrumenten en/of aanbestedingsrichtlijnen worden ontwikkeld die recht doen aan de waarden van de wetenschap.

**Aanbevelingen**

In hoofdstuk 5 wordt samengevat wat we hebben geleerd van de pandemie en doen we aanbevelingen voor een toekomstgerichte aanpak. We maken hierbij onderscheid tussen thema’s met hele directe gevolgen van de pandemie, en bredere thema’s die al vóór de pandemie in beweging waren, en waar de crisis het belang van deze transities onderstreepte. We pleiten voor het instellen van organisatorische post-COVID-teams die de (middellange- en langetermijn)effecten van de pandemie, het succes van maatregelen, maar ook het beloop van veranderingen met impact op wetenschappers, wetenschappelijke carrières, de wetenschapsbeoefening en academische gemeenschap als geheel actief blijven monitoren.

De pandemie heeft gefungeerd als een soort vergrootglas, waardoor de barstjes in het wetenschapsbestel beter zichtbaar werden. Laten we nu de kans grijpen om deze te repareren.
1. INTRODUCTION

1.1 Background

The COVID-19 pandemic and all its devastating social, economic and health consequences did not bypass academia and the past two years have left their mark on the academic community. The pace of scientific and scholarly developments has been incredible. The pandemic has offered some researchers unprecedented opportunities, but it has also put considerable pressure on academics and academic institutions, and on some groups of academics in particular, resulting in divides, inequalities and a high level of stress on systems and individuals. Lockdowns and other measures have forced the sector to fundamentally change its working practices and, at times, accelerated transformations that were already underway. As a result, it is probably fair to say that academia will never return to the ‘old normal’. But how it will evolve and which changes it will embrace going forward is an open question. This report will provide some preliminary answers to that question.

Two weeks after the SARS-CoV-2 virus had first been isolated, its genetic sequence was published, serving as the basis for PCR testing and the development of mRNA vaccines. Since then, the academic research community has continued to play a crucial role in generating the knowledge needed to overcome this crisis. This knowledge has often had a direct impact on people’s lives, from epidemiological modelling as a basis for outbreak management and wider socio-economic policies to behavioural and social science studies investigating whether and why people comply with measures, and from researchers shedding light on the psychological and social impact of social distancing to legal experts analysing the implications of the unprecedented government measures or medical ethicists playing an active role in drafting the ‘code black script’ for intensive care units.
While the role of research and researchers has featured prominently in the debate on how to deal with the pandemic, we have also seen the consequences of disinformation and conspiracy theories as well as public resistance to and the politicization of scholarly claims. Do they indicate that trust in science is eroding? Even more worrying are the attacks on scholars on the frontlines of generating COVID-related evidence and recommendations. In particular, those who give media interviews or post on social media about COVID-related matters often face threats, harassment or abuse (see Chapter 2). Scholars, moreover, are no different than other people in feeling the impact of the pandemic on their personal and working lives. Many of those not conducting COVID-related research have been, and still are, confronted with project delays, postponed funding, closed laboratories and cancelled fieldwork, not to mention the time spent adjusting their research, teaching, management and outreach approaches while simultaneously homeschooling or caring for relatives. Careers have been put on hold. The funding landscape has undergone major changes, some positive and others negative. There are numerous indications that certain groups or categories of scholars have been disproportionately affected, depending on their field of study, career phase and family responsibilities (see Chapter 3). Finally, research practices have also changed significantly throughout the pandemic – conferences and brainstorming had to move online and the higher education system has been through an unprecedented process of digitalization. At the same time, it has become clear that the established processes of academic publishing and peer review are increasingly at odds with the new challenges that have arisen in academic research, driven by the need for speed and an explosive increase in the number of COVID-related publications (see Chapter 4).

Now is the time to take stock. What are the problems and which changes are imminent? And how do we maintain the momentum for positive change? Which changes would we rather not keep? What action is needed to mitigate the negative consequences, and which actors or institutions will need to take charge of these actions?

1.2 Task of the committee

All of the questions posed above persuaded the Board of the Royal Netherlands Academy of Arts and Sciences to establish a committee to study the impact of the pandemic on academia, with a focus on trust and the effects on academics and academic practices (Annex 1).

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1 Simultaneously, another committee was installed to reflect on how scientific research in the Netherlands can best prepare for a future pandemic, see: KNAW. Met de kennis van straks, de wetenschap goed voorbereid op pandemieën. Amsterdam, in press, 2022
The composition of committee is as follows:

- Natali Helberger (Distinguished University Professor of Law and Digital Technology, UvA), chair
- Carlijn Bouten (Professor of Cell-Matrix Interactions in Cardiovascular Regeneration, TUE)
- Lex Bouter (Professor of Methodology and Integrity, AUMC and VU)
- Giselinde Kuipers (Professor of Sociology, KU Leuven)
- Cyrus Mody (Professor of History of Science, Technology, and Innovation, Maastricht University)
- Hedwig te Molder (Professor of Language and Communication, VU)
- Bettina Reitz-Joosse (Associate Professor of Latin Language and Literature, RUG)

Assisted by secretary Eva Naninck (Academy Bureau).

The committee aims to shed light on how the COVID-19 pandemic has impacted and still impacts the academic community by affecting – in both negative and positive ways – scholars, academic research practices and trust in academia.

Although most members of the academic community have been affected by the pandemic, this report focuses specifically on research and researchers and leaves aside topics that have been addressed, and continue to be addressed, elsewhere. This is a matter of scoping and not of downplaying the unprecedented impact of the pandemic on, for example, higher education, traditional educational practices, students and teachers. This committee defines the academic research community as ‘the collective of all early-career, mid-career and established researchers and their teams engaged in research at academic institutions’. Throughout the project, the committee sought to pay special attention to the various ways in which different groups in the research community were affected, and to include the voices of researchers from the full spectrum of scientific and scholarly disciplines and in different career stages.

This report aims to deliver internationally relevant insights and has therefore been written in English. Some aspects may, however, be specific to the Dutch situation.

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1.3 Approach

For this report, the committee consulted national and international reports and publications and consulted a wide range of experts (see Annex 3). During its various meetings, the committee decided to approach the topic from four angles. For each of these angles, it organized a public online expert meeting to gain an in-depth understanding of the impact of the COVID-19 pandemic on research and researchers. During these meetings, invited external experts shared their insights and the audience commented, posed questions and shared its experiences. This information was incorporated into this report so as to reflect, as much as possible, the experience of the broader academic community. Some of the statements made during these meetings nicely capture the various sentiments of the academic community and are used throughout the report to illustrate the main text. The expert meeting on ‘Trustworthy science in the public domain’ served as the basis for Chapter 2. The expert meeting on ‘Impact of COVID-19 on researchers’ provided the basis for Chapter 3. The discussions during the expert meeting on ‘Academics on fire’ informed section 2.4.2 and Chapter 4. The expert meeting on ‘Science and digital technology’ was the basis for section 4.3. The committee gratefully acknowledges the valuable input provided by the experts and members of the audience during these meetings. The report was finalized after the draft version was reviewed by external reviewers, the Academy’s Advisory Councils and the Academy Board.
2. IMPACT OF THE COVID-19 PANDEMIC ON TRUST IN ACADEMIC RESEARCH

2.1 The infodemic

‘It is vital that we stay the course based on the compass of scientific knowledge and trustworthy facts.’ These words – spoken by the Dutch prime minister during his televised address at the start of the first lockdown in March 2020 – illustrate how the COVID-19 pandemic has highlighted the need for scientific and scholarly knowledge in a sea of available information. At the same time, the pandemic has shown that scientific and scholarly expertise can be a subject of bitter dispute, particularly when it has implications for how authorities deal with major social issues, such as vaccine hesitancy. This is not a new phenomenon but it is attracting increasing media attention and is a source of growing concern among many scholars.

Since the start of the pandemic, every day researchers have been interviewed in the media, advising policymakers and writing social media posts. Headlines trumpet the latest research results. Information-seeking and social media attention for scholars and (sometimes self-proclaimed) health experts increased exponentially, particularly in the early stages of the pandemic, as part of a widespread rise in news consumption. In addition, the pandemic has revealed that social media platforms have become increasingly popular news sources, where different personalities and outlets compete for the public’s attention. Social media platforms have changed the

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3 In Dutch: ‘Het is belangrijk dat we op dat kompas van wetenschappelijke kennis en betrouwbare feiten blijven varen’, Mark Rutte, 16 March 2020

dynamic of information exchange in the public debate. On the one hand, they help experts disseminate accurate information; on the other hand, they are also deployed to distribute misinformation. 5

During the pandemic, it was not only the SARS-CoV-2 virus that spread rapidly across the globe, but also misinformation and conspiracy theories. 6 Crises have always been a breeding ground for misinformation, 7 but today’s overwhelming amount of (mis)information circulating in the mainstream and social media and on the internet makes it even more difficult to judge which sources are trustworthy. This is often referred to as ‘the infodemic’. 8 For some, conspiracy theories offer an alternative to evidence-based information. In addition, it has become very easy for everyone to obtain information (exclusively) from sources that are consistent with their own system of belief. 9 However, there is no one or simple explanation for the popularity of conspiracy theories, as the reasons for engaging with conspiracy theories are very diverse and result from a range of psychological, political and social factors. 10,11

2.2 Surfing on a wave of trust?

Since the start of the pandemic, public mistrust of science has been a growing concern, for example because it can result in lower levels of compliance with public health policies and restrictions, 12 thereby aggravating the crisis. It is, however, incorrect to simply state that public trust in science in general is declining. In fact, public opinion surveys in various European countries showed increasing trust in

science (in a generic sense) throughout the COVID-19 pandemic.\textsuperscript{13} In Germany, the \textit{Science Barometer 2021} revealed that trust in science and research had increased in the context of the coronavirus pandemic (2021: 61\%, 2020: 60\%, 2019: 46\%, 2018: 54\%, 2017: 50\%).\textsuperscript{14} In the Netherlands, the Rathenau Institute conducts a survey every three years among a representative sample of the Dutch population. Their March 2021 survey shows that on average, respondents rated their trust in science at 7.42 (on a scale from 1-10; N=1513), 0.35 higher than the 2018 survey.\textsuperscript{15} Interestingly, the respondents who reported an increase in their level of trust (24\%) and those who reported a decrease (16\%) both often referred to the rapid development of coronavirus vaccines as the main reason. The Rathenau Institute’s findings are in line with the results of a survey conducted in June 2021 among 1,246 Dutch respondents, part of a longitudinal study on the attitudes, trust and willingness of (groups) of people to use digital solutions during the COVID-19 crisis. These results show that on average, the respondents trust science to create value for society and that their trust in science increased during the COVID-19 crisis. Interestingly, respondents not only place their faith in the medical disciplines but also in the social sciences, law and philosophy.\textsuperscript{16}

The Rathenau Institute reports that trust in science is higher in respondents who are more familiar with science, for example because they read about it in newspapers or discuss it with friends or family. Respondents with a higher educational level have significantly higher levels of trust in science than respondents with a medium or lower educational level. The UK survey on trust in science during the COVID-19 pandemic shows, not surprisingly, that those who have a positive disposition towards science display more trust in scientists. The report states that ‘trust in scientists among those who are already positive about science is extremely resilient and not easily moved by negative news coverage or events. Secondly, trust is hard to build among those who do not have a positive disposition to science already. It may move around in response to media coverage, but there are deeper reasons for distrust that keep these two groups apart.’\textsuperscript{17}

\begin{itemize}
\item \textsuperscript{13} PCST network & EASEA. Askvall C, Bucchi M, Fähnrich B, Trench B, Weißkopf M. \textit{Trust in science: assessing pandemic impacts in four EU countries}. 2021
\item \textsuperscript{14} Wissenschaft im Dialog, \textit{Science Barometer 2021}. Berlin, 2021
\item \textsuperscript{15} Rathenau Instituut. Broek-Honingh van den, N, Glas I, Vennekens A. \textit{Vertrouwen van Nederlanders in wetenschap (enquête 2021)}. Den Haag, 2021
\item \textsuperscript{16} The questions about trust in science were included on initiative of this committee. Data was analyzed by dr. J Strycharz, University of Amsterdam
\item \textsuperscript{17} Ipsos MORI. Skinner G, Garrett C, Navin Shah J. \textit{How has COVID-19 affected trust in scientists? Survey research for UK Research and Innovation carried out during the COVID-19 pandemic}. 2020
\end{itemize}
Regarding reasons for distrust, social scientists have long recognized a growing tendency to use ‘science’ to bolster public authority. In modern society, the public is increasingly expected to place its trust in institutions, authorities and practices justified in the name of ‘science’, without, however, much thought being given to the question of how the culture of the relevant scientific and policy institutions itself impacts trust in science. It is beyond the remit of this report to reflect at length on the institutional arrangements of academic research and the embedding of scientific advice in policymaking during the COVID-19 pandemic (see ), but the possible contributory role of scientific and policy institutions to public mistrust should be taken into account.

2.3 Building trustworthiness

What determines whether the practices, capabilities and limitations of academic research are understood in context and successfully acted upon? And how can institutions and scholars that produce high-quality research earn trust from the public? Beyond the question of ‘how high is the level of public trust in science?’ lies another question: ‘What does it mean for scholars and scholarly work to be trustworthy to the public?’ It is important to make the distinction between trust and trustworthiness (i.e., being worthy of trust; displaying behaviour that is honest, transparent, competent and reliable), as the latter has a normative dimension and shifts responsibility from the public to institutions and academics.

In general, scholarly work is trustworthy when it honours scientific norms, such as transparent reporting, replication, self-correction and controlling for bias. These academic practices may be not always be recognized by the public at large, however. The processes of science, and in particular its inherent processes of constant scrutiny and scholarly debate to ensure the quality and robustness of research findings, can be sources of both trust and mistrust. The Rathenau Institute’s surveys, among others, show that the Dutch public values transparency in science, but loses trust when that transparency reveals disagreements among scientists. This paradox is

18 Wynne B. Public engagement as a means of restoring public trust in science-hitting the notes, but missing the music? Community Genet. 2006;9(3):211-220. doi:10.1159/000092659
19 KNAW. Met de kennis van straks, de wetenschap goed voorbereid op pandemieën. Amsterdam, in press, 2022
partly due to – but also creates incentives for – the tendency of scientists to cultivate certainty and downplay disagreement among experts. Additionally, not everyone may be aware of the ever-evolving nature of science in which most ‘truths’ are only temporary in nature. As stated in an IIASA-ISC report, ‘COVID-19 has brought science to the forefront of public attention and highlighted the lack of public understanding as to how science functions and what science can and cannot do.’

Those who claim ‘to follow the science’ (politicians, science advisors, etc.) and scholars themselves often forget to mention that research results are not set in stone, but shaped by progressive insight over time (e.g., uncertainty about the risk of airborne transmission of the SARS-CoV-2 virus led to mixed messaging about the relevance of wearing face masks). In addition, scientific knowledge is generated under well-defined conditions; changing parameters might change the outcome. For example, measures previously proven to be effective in limiting the risk of hospitalization after SARS-CoV-2 infection (i.e., two-dose vaccination) can become less effective when new and more contagious variants of the virus emerge (resulting in the need for booster vaccinations). One of the Mertonian norms – formulated in 1942 by Robert Merton to describe the ideal scientific community – includes ‘organized scepticism’, expressing the idea that the acceptance of all scientific work should be conditional on assessments of its scientific contribution, objectivity and rigor.

In the ideal research community, no knowledge claim is regarded as ‘sacred’. In reality however, the research climate falls short of this ideal, due to its competitive and hierarchical nature, for example when knowledge claims are interpreted based on the status of the researcher, or when researchers fail to be open to dissenting opinions.

In addition, academics should be open about what they don't know and not stray too far outside their lane. Over the course of the pandemic, we have witnessed many experts addressing issues beyond their intellectual training and competence, crowding out real experts and creating confusion. To give an example, there was the prominent Israeli mathematician who predicted that the virus would play itself out in 70 days, irrespective of any containment measures. This phenomenon is known as ‘epistemic trespassing’ and refers to a situation in which experts who have the competence or expertise to make a good judgment call in one field move on to another field where they lack such competence, but pass judgment nevertheless.

‘Trespassers’ are often unaware of what they don't know, while true experts are better at recognizing uncertainties and updating their judgments in the light of new evidence. There is nothing wrong with admitting ‘I don’t know’; in fact, research

shows that being open and transparent about uncertainty in science does not undermine public trust in evidence.\textsuperscript{27}

It is not only up to scholars to explain how new evidence led them to update earlier findings, however; it is also up to politicians to explain how they use scientific evidence in policymaking and why they adopt or adapt certain policy or other decisions. In addition, politicians need to be transparent, not only about the epistemic considerations but also about the practical and tactical ones underpinning their decisions.\textsuperscript{28} Whether or not to follow science-based advice is always a choice. Scholars are needed to feed the debate and enable evidence-informed policymaking, but they should be careful to inform politicians rather than tell them what to do or let them ‘hide’ behind the science. As Roger Pielke points out in \textit{The Honest Broker}, it is important to discuss roles and responsibilities when scholars engage with decision-makers and the public. The multiple possible roles that a scholar can fulfil (pure scientist, science arbiter, issue advocate and honest broker) are all important and very much context-dependent. It is, however, a scholar’s responsibility to be informed about the real-world political context before engaging in interaction with politicians and the public at large, and they should refrain from hiding advocacy behind a façade of science.\textsuperscript{29} But politicians also bear a responsibility, i.e. to refrain from pathologically politicizing scholars and scholarship, and to be respectful of their academic autonomy and their particular role in society.

\subsection*{2.4 What is at stake?}

The urgency of the pandemic and the rapid pace of political decision-making put the scientific debate under extreme pressure and on display. This debate, which usually unfolds over a number of years in scientific journals and at academic conferences, has not only been accelerated (see Chapter 4) but has also drawn the critical eye of a public that is often unfamiliar with the scholarly process. Instead of focusing solely on educating the public (e.g., to better understand scientific knowledge, the scholarly process and the benefits of science),\textsuperscript{30} academic researchers need to become aware that trust and trustworthiness also depend on what is at stake. The following

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\textsuperscript{29} Pielke RA. \textit{The Honest Broker: Making Sense of Science in Policy and Politics}. Cambridge: Cambridge University Press, 2007. doi:10.1017/CBO9780511818110

\textsuperscript{30} Wynne B. Public engagement as a means of restoring public trust in science-hitting the notes, but missing the music? \textit{Community Genet.} 2006; 9(3):211-220. doi:10.1159/000092659
\end{flushright}
example, adapted from Peels & Bouter, illustrates this pragmatic dimension of trust: ‘if there is only a 1% chance that the gun in my hand is loaded and the purpose is to shoot in the air (e.g., for celebrating a victory), I can trust that it is empty. If there is only a 1% chance that the gun is loaded, but I am putting the gun to my head, I cannot rationally trust that it is empty’. Thus, whether research findings are considered trustworthy is not purely a matter of the quality and robustness of the evidence, but also depends on practical and pragmatic considerations.

2.4.1 Hidden morality
At first glance, disputes concerning COVID-19 policies revolve around scientific findings (e.g., the efficacy of social distancing). Below the surface, however, these disputes are not so much about the scientific facts in themselves, but rather about the (denial of) values associated with these facts (e.g., how social distancing affects our interactions with family members and grandparents). The way in which people think and act (and trust research findings) is never independent from their norms and values. Recognizing that ‘debates about public facts have always also been debates about social meanings, rooted in realities that are subjectively experienced as all-encompassing and complete, even when they are not’ might help us realize that building trustworthiness in modern society requires a fundamental shift from a ‘let-me-explain-it-once-more’ repertoire or a debate mode to a sustained dialogue in which the interplay between morality and science can be openly examined, questioned and discussed.

More facts don’t breed trust, insights and inclusion do

The long-held idea that greater knowledge of the facts among the public will automatically increase trust in academic research appears to be incorrect, as shown during the pandemic. In fact, ideologies, worldviews, social relationships and networks play a more important role in the level of trust in academic research than lack of (valid) information. Trust or lack of trust in science depends largely on who trusts or mistrusts which specific domain of science. During the pandemic, we have also seen that public mistrust or rejection of science is not indiscriminate. A series of online surveys on attitudes to science and trust in scientists carried out in the UK in 2020 revealed that trust in COVID-19 scientists was somewhat lower than trust in scientists generally (55% of the respondents considered them trustworthy,

compared to 60% for scientists in general).\textsuperscript{34} Indeed, science scepticism is domain-specific, and typically contentious topics include evolution, genetic modification, social inequality and exclusion, climate change, vaccination and the COVID-19 pandemic, with COVID-19 scepticism incorporating aspects similar to both climate-change denial and vaccine hesitancy.\textsuperscript{35} Drivers of science scepticism are very heterogeneous; political partisanship, for example, is closely associated with climate scepticism, while spirituality is a better predictor of vaccine scepticism.\textsuperscript{36} In addition, science scepticism varies across countries and cultures.\textsuperscript{37}

The reaction of many scholars is often to fall back on a fact-value dichotomy and a knowledge deficit model of 'public understanding' of science, i.e. that facts are facts regardless of values, worldviews or emotions, and that if the public only had a better understanding of the facts, then all would be well. Clearly, the usefulness of facts and knowledge is evident. Debunking approaches (e.g. fact-checking) are important for countering falsehoods and prebunking can help people to spot and recognize misinformation (this includes forewarning people and exposing them to a mild dose of fake news to generate psychological resistance to it, for example in a fake news game\textsuperscript{38}). Too much emphasis on persuasion, however, may harden public contestation of scientific and scholarly expertise. Often, the reasons for distrusting or rejecting scientific and scholarly knowledge go beyond merely misunderstanding or lacking knowledge, and are related to emotions and values.\textsuperscript{39} Sociological research shows that even if debunking reveals certain information to be false, people may continue to endorse that information as a way of expressing their identity, indicating that 'it is not so much the truthfulness of information that counts, but people’s social distance to the producers and adjudicators of knowledge.'\textsuperscript{40} As an example, a study

\begin{itemize}
  \item \textsuperscript{34} Ipsos MORI. Skinner G, Garrett C, Navin Shah J. How has COVID-19 affected trust in scientists? Survey research for UK Research and Innovation carried out during the COVID-19 pandemic. 2020
  \item \textsuperscript{38} Roozenbeek J, van der Linden S, Nygren T. Prebunking interventions based on “inoculation” theory can reduce susceptibility to misinformation across cultures. Harv. Kennedy Sch. Misinformation Rev. 2020, doi:10.37016//mr-2020-008
  \item \textsuperscript{39} Durnová A. Understanding emotions in post-factual politics: negotiating truth. 2019. Edward Elgar Publishing.
  \item \textsuperscript{40} Harambam J. Against modernist illusions: why we need more democratic and constructivist alternatives to debunking conspiracy theories, Journal for Cultural Research. 2021,25(1): 104-122. doi:10.1080/14797585.2021.1886424
\end{itemize}
addressing trust in experts and authorities during the initial weeks of the COVID-19 outbreak in Italy revealed that people’s willingness to update wrong beliefs did not increase (and in fact even decreased) when the source of the information was explicitly identified as an expert. This urges us to rethink science communication: rather than seeing it only in terms of explaining, presenting and debating, we must, above all, stress the ability to engage in dialogue, with an eye for the underlying values and assumptions that dialogue can bring to the surface.

There is a difference between ‘matters of fact’ and ‘facts that matter’

2.4.2 Scholars under attack
Alarminglly, distrust of expert opinions and research findings fuels public hostility to scholars. Scholars who take their responsibility to enrich the public debate with their knowledge and expertise – some of them becoming as well-known as celebrities – are often confronted with the toxicity of conventional and social media platforms. The scientific journal *Nature* conducted a survey among more than 300 scholars who have given media interviews about COVID-19, many of whom had also commented about the pandemic on social media. The survey showed that more than two-thirds of researchers reported negative experiences as a result of their media appearances or their social media comments, 22% had received threats of physical or sexual violence, and 15% reported having received death threats. In the words of leading virologist Marion Koopmans after receiving the umpteenth threat, ‘We shouldn’t think this is normal, unfortunately this seems to be the case. I’m done with it to be honest’.

This is deeply concerning, first of all because targeted scholars are instantly hurt by the threats, hate speech and intimidation. Their (sense of) social safety declines and it may cause stress and anxiety for themselves and their loved ones, mental health problems and reputational damage. In addition, it may have a chilling effect, a type of self-censorship caused by hate-filled attacks that may discourage scholars from speaking up and sharing their insights. This effect seems to affect women more, possibly because of the types of threats aimed at them. For women and people of colour, threats and abuse often include obscene attacks on their personal characteristics (gender-based harassment or racism). The possibility that scholars

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42 Nogrady B. ‘I hope you die’: how the COVID pandemic unleashed attacks on scientists. *Nature News Feature*, 13 October 2021
44 Sluiter I, Open doors, dies lecture delivered at Leiden University, 8 February 2021
will avoid certain topics or withdraw from public engagement out of fear of hostility is a serious threat to academic freedom.\textsuperscript{45} When the chilling effect disproportionately impacts women and people of colour, this not only robs society of their knowledge and perspectives but may also compromise diversity and inclusiveness in academia.

In October 2021, Universities of The Netherlands (UNL) – the overarching organization representing all the Dutch universities – published guidelines for ‘Addressing threats to and harassment of scientists’ intended to be a source of support for every academic scholar and university leaders.\textsuperscript{46} The guidelines include a number of best practices that can be applied locally, as well as measures to be implemented at the national level, in the Netherlands:

- Universities will maintain a zero-tolerance policy in connection with threats and harassment aimed at scientists. Cases involving threats, physical or sexual violence, stalking or unlawful entry will be reported to the police.
- All universities will strive to enact broader support measures, both preventative and reactive. These measures may include online resilience training, for example, or providing psychosocial assistance.
- Establishment of the platform: WetenschapVeilig. This platform, a joint initiative of the Dutch Research Council (NWO), UNL and the Academy, will be structured as an independent charitable foundation (comparable to PersVeilig) and is aimed at improving the collection and provision of information, measures, and the interaction with the justice system and the police at a national level.

Universities – rightfully – encourage visibility, impact and outreach, and they are proud when their scholars are in the spotlights. Universities should, however, also take action to protect their vaunted experts when they are attacked. The first thing they should do is stand by their staff: this means that communication and legal departments should be equipped to offer support, and that managers should contact their staff if they see that they are under fire. Furthermore, instead of making remarks such as ‘You were pretty outspoken there, weren’t you?’ or similar unhelpful behaviour, colleagues should offer help and support (also as part of jointly ensuring a socially safe workplace culture in academic institutions and the behaviour that comes with it, also see\textsuperscript{47}). All members of the academic community need to be ‘active bystanders’, alert observers who do not avert their eyes when these things happen to their peers.\textsuperscript{48}

\textsuperscript{45} For a definition of the concept of academic freedom with regard to academic research and education in the Netherlands see: KNAW. Academische vrijheid in Nederland – een begripsanalyse en richtsnoer. Amsterdam 2021
\textsuperscript{46} VSNU, Handreiking aanpak bedreiging en intimidatie van wetenschappers, 2021
\textsuperscript{47} KNAW, Sociale veiligheid in de Nederlandse wetenschap. Van papier naar praktijk, Amsterdam, 2022
\textsuperscript{48} Sluiter I, Open doors, dies lecture delivered at Leiden University, 8 February 2021
2.5 The societal mission of science

The pandemic placed academic researchers prominently in the public arena. Despite the downsides discussed in the previous section, this emphasized the societal mission of science. In addition to research and education, *relevance for society* is the third core mission of academic institutions. The pandemic turned the buzzwords ‘valorisation’, ‘outreach’ and ‘visibility’ into a new reality, and academic researchers have shown that they can contribute substantially to the quest to solve society’s major challenges.

The nature of the COVID-19 crisis placed researchers in certain domains squarely in the spotlight (such as medical researchers, mathematical modellers and social and behavioural scientists49), while the role of researchers in other scholarly domains remained less visible. Even so, this crisis has illustrated that a *broad basis* of scholarly knowledge is needed to deliver a rapid and effective response to a crisis. In the COVID-19 crisis, for example, the work of historians who study pandemic outbreaks, such as the Black Death and the 1918 influenza outbreak, suddenly had pertinent lessons to offer on how to deal with, and rebuild from, a pandemic. The crisis also underscored that *both* unfettered and strategic research are crucial for scientific, technological and societal breakthroughs.50 They are not mutually exclusive. For example, the rapid development of COVID-19 vaccines would not have been possible without decades of basic research to build on. It took many small steps before the discoveries of liposomes and mRNA (both dating from the 1960s) could turn into life-changing COVID-19 mRNA vaccines.51 Consider too research on democratic theory, a very specialized field that suddenly became highly relevant as modern-day democracies confronted new challenges, for example as the pandemic led to the cessation and transformation of parliaments and enabled governments to rule by decree.

The pandemic highlighted the societal impact of science, in particular in certain research domains. It boosted awareness that ‘making an impact’ is not the sole responsibility of researchers who are intrinsically motivated to do so,52 and that it is not something that occurs ‘on the side’, but that it takes time and requires training and enough practice, as well as professional institutional support. The pandemic has highlighted that academics and academic research are in the public arena much more

50 KNAW. *Evenwicht in het wetenschapssysteem. De verhouding tussen ongebonden en strategisch onderzoek*. Amsterdam, 2019
51 Dolgin, E. The tangled history of mRNA vaccines. *Nature news feature*. Published 14 September 2021
52 SWR. *Wetenschap met de ramen wijd open; tien lessen voor wie impact wil maken*. Amsterdam, 2022
than they used to be, and that new skills are therefore required. While academics are well trained in writing papers and making presentations at scientific conferences, most have received little training in science communication and in using – and dealing with – mainstream and social media and their particular dynamic. Rethinking the skillset of academics also requires that researchers who make an active effort to engage with the public are recognized and rewarded for doing so. Not every researcher can or should become a communication expert, but those who are good at it must be appreciated for these skills and supported by their institution to develop them further.

We discuss impact and social engagement issues here because whether or not someone trusts academic research is closely related to whether they think academic research is meaningful for society. In general, meaningful public engagement – a dialogue in which researchers are open about their work and understand and respond to public priorities – helps to build trust. It is not, however, easy to include the general population in defining ‘our collective problem’. The pandemic has taught us that sometimes, circumstances change quickly and what ‘the public’ wants or needs changes along with them. For example, what the Dutch public wanted from science in 2019 was – at least in certain areas – quite different from what it wanted in 2020 or 2021. Large-scale initiatives to boost the public legitimacy of science and to open up scientific decision-making to the public are counterproductive if they cannot account for changing circumstances.

2.6 Lessons learned

In conclusion, we need to seize the momentum to discuss and create the right conditions for a ‘social contract’ between science, policy and society, based on mutual commitment and respectful dialogue. Not only is it important for scholars to be protected from threats, but they must also be given the space to show vulnerability, admit when a mistake has been made, and be open about how academic research works. The pandemic exemplified the need for transparency and good communication with the public, and that is what we must invest in. It is key here that scholars are aware of their own position and take responsibility for their – unavoidably value-laden – choices. At the same time, we should not be naïve about this. The pandemic has made it clear once again that science is a subject of struggle, both within the academic community and in society as a whole. More openness and better communication do not protect against mistrust or politically or economically motivated attacks. Thus, science must not only be able to show its vulnerability, but it must also be resilient. In particular, the firmness with which politicians make science responsible for a particular policy, can provoke incomprehension and resistance in society. The role of science and scholars in policymaking and policy communication (especially in a crisis) must therefore be part of the debate.
3. IMPACT OF THE COVID-19 PANDEMIC ON SCHOLARS

Scholars, like almost everyone else around the world, have been and continue to be affected by the coronavirus pandemic both in their work and their personal lives. The pandemic has acted as a magnifying glass in exposing existing shortcomings, deficiencies and inequalities in the academic research system. At the same time, the resilience and creativity of those who have managed to mitigate the negative impact of the pandemic have opened and shaped new avenues. In addition, the COVID-19 crisis has offered those scholars who have been able to quickly adapt their research to the current circumstances a wealth of new data, research questions and successful worldwide partnerships.53 Before focusing in Chapter 4 on the new ways of working and accelerated scholarly progress, however, we look in this chapter at the impact on scholars’ working and personal lives and career prospects and consider what can be done to support them, in particular those most seriously affected.

3.1 How the pandemic impacted researchers

3.1.1 Research practices

The pandemic seriously disrupted academic research in many research areas: archives and libraries closed their doors, clinical studies and trials were halted, fieldwork and expeditions were cancelled and laboratories paused experiments. In certain instances, the crisis reduced the quality and quantity of data (for example, the reduced number of aircraft taking air-based measurements compromised atmospheric and climate monitoring, according to the World Meteorological

Organization, and data-gathering had to move from face-to-face to online. Once facilities began to reopen, researchers needed to deal with the challenges of ongoing supply chain disruptions, travel restrictions and social distancing, compromising their normal way of working, while the erratic nature of the pandemic made it difficult to plan when and how to resume research projects.

Scholars did their very best to remain productive, despite these challenges, for example by focusing on analysing existing datasets, reviewing and writing articles, reviews and grant proposals. The extent to which the pandemic has impacted researchers depends on many factors, however, including their career stage, their discipline, whether they had teaching, management and/or patient care responsibilities, whether they had care tasks, whether they belong to underrepresented minorities, whether they were able to work from home, their digital literacy skills, their health, the level of institutional support they received, and other factors, many of which were beyond their control. For example, researchers who gather their data during expeditions or fieldwork, in face-to-face interactions in real-life settings (such as a classroom), in the lab or hospital, or in libraries or archives have faced sometimes lengthy delays. Scholars working in such environments appear to have lost more research time than those working in domains that make more use of software and online facilities. Examples include research in developmental psychology, pedagogy and educational science, which rely heavily on the ability to study child behaviour in real-life settings, or clinical research in hospital settings where researchers were often co-opted to provide COVID-related patient care.

Besides anecdotal evidence found in social media and the popular press, there is growing quantitative evidence concerning the nature and magnitude of the disruption that the pandemic is causing among academic researchers. In the Netherlands, The Young Academy (DJA) and the Dutch Network of Women Professors (LNVH) studied the impact of the first lockdown on the work and well-being of

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55 ResearchGate report, *Science hasn't slowed, it's just moved online*, 2021


58 Brummelman E, Sierksma J. Opinie: Na twee jaar stilstand is onderzoek naar sociale ontwikkeling bij kinderen extra hard nodig. *Het Parool* 14 March 2022
The survey was completed by 5,920 academic employees, of whom 40% reported a loss in research time in the first months of the pandemic. The perceived loss of research time was most prominent among assistant and associate professors (54% of both groups reported a loss, compared to 39% of full professors and 27% of PhD candidates). Of the time devoted to different tasks, research time decreased most. Time spent on impact activities decreased as well, while management-time remained stable and the time spent on teaching increased, due to the immediate shift to online teaching.

2021 was my best publishing year ever, because we have been wrapping up old stuff. This is not a sustainable tactic. It means that next year will be much worse because we haven’t been generating new data

This is in line with the results of an international survey amongst more than 4,500 EU- and US-based academic researchers showing an average decline of 11% in the total number of working hours per week in the initial month of the pandemic. Of the time devoted to different tasks, research time decreased the most by an average of 24%. This effect varied, however, with 21% of researchers reporting that they spent more time on research and 9% reporting no change.

Over the course of the pandemic, the academic workload also increased. In 2020, de Gruyter conducted two surveys amongst academic authors. One was in May and involved 3,214 respondents from 103 countries, and the other was in October and involved 1,100 respondents from 78 countries. In the October survey, 53% of the respondents – substantially more than in May – reported feeling far busier than before the pandemic began. In addition, 48% of the researchers who conduct primary research reported that their research had been held back or disrupted in some way. The report identifies three factors that limit academic productivity most: a lack of formal or informal academic networks; excess work due to online teaching and student supervision; and the challenges of working from home and the blurred boundaries between work and family life.

3.1.2 Inequality, with a focus on care duties, gender and career stage
All the above-mentioned studies also highlight disparities in the pandemic’s impact on academic researchers at different points of their lives and careers. For example, there are apparent disparities between researchers belonging to different

demographic groups and between those with and without care duties (e.g., for young children or elderly parents). In particular, scholars with young children living at home were disproportionately affected.\textsuperscript{59,60}

Juggling working from home with home-schooling and childcare during lockdowns significantly reduced research time. In the Dutch survey, 51\% of the academics who had children living at home (both men and women) reported that the pandemic decreased their research time, compared to 32\% of academics without children. The reported lost time was double that of academics without children in their household. As shown by Myers et al.,\textsuperscript{62} this ‘child effect’ depended on the children’s ages; the younger the children, the larger the effect. The Dutch survey showed a somewhat similar association between children at home and perceived loss of research time; however, female academics with children reported experiencing more work-family conflict than their male counterparts. This reflects the gender discrepancy observed in the general population, where, on average, the burden of unpaid care work (childcare, cooking, cleaning, organizing) is still largely undertaken by women. The same is true of the increased domestic workload during the lockdowns,\textsuperscript{63,64} with female academics being no exception.\textsuperscript{65,66}

The pandemic may lead to a setback in gender diversity in academia.\textsuperscript{67,68} Across disciplines, gender discrepancy became apparent in the number of published papers and citations during the early stages of the pandemic. For example, a gap was observed in the research productivity of female economists,\textsuperscript{69} and in the biomedical

\textsuperscript{65} Langin K. Pandemic hit academic mothers hard, data show. \textit{Science}. 2021, doi: 10.1126/science.371.6530.660
\textsuperscript{68} Deryugina T, Shurchkov O, Stearns J. Covid-19 disruptions disproportionately affect female academics. AEA Papers and Proceedings, 2021
sciences females accounted for fewer first authors than expected,\textsuperscript{70,71} especially in COVID-related research publications. In addition, the Dutch DJA-LNVH survey showed that female academics with children at home were more likely than their male counterparts to be working in an early-career position (PhD candidate, postdoc or assistant professor; 58.4% female versus 46.6% male) and on a temporary contract (23.4% female versus 17.4% male). Female academics with young children were in more precarious career stages than their male counterparts and experienced more stress about their research progress and their future in academia.\textsuperscript{72}

Those who were already vulnerable are being hit the hardest

The vulnerability of early-career scholars (across genders) deserves particular attention. Even in normal times, early-career researchers are under high pressure. This group accounts for the largest share of the academic research community and has been disproportionately affected by the pandemic.\textsuperscript{73} Most early-career scholars are working on temporary (short-term) contracts. Compared with other European countries, the Netherlands has a large proportion of university personnel (including PhD students) working on temporary contracts, anywhere from 29% to 52% depending on the university.\textsuperscript{74} Early-career academics who have completed their PhDs are also often employed on a temporary contract in the Netherlands. To take the next step in their academic career path, establish their independence and obtain another temporary or permanent contract, they all need to be able to conduct research and publish their findings, apply for funding, spend time abroad as a visiting researcher, attend conferences to network and so on. The direct and indirect effects of the pandemic, which prevented them from doing so, extend beyond a reduction in academic productivity and could cause considerable career damage.

\textsuperscript{70} Andersen JP, Nielsen MW, Simone NL, Lewiss RE, Jagsi R. COVID-19 medical papers have fewer women first authors than expected. \textit{Elife}. 2020, doi:10.7554/eLife.58807
\textsuperscript{72} Bol T, Derks B, Poorthuis L. The impact of the COVID-19 pandemic first lockdown period on the work and well-being of academics in the Netherlands. Amsterdam/Utrecht, De Jonge Akademie/LNVH, 2021
\textsuperscript{73} Herman E, Nicholas D, Watkinson A, et al. The impact of the pandemic on early career researchers: what we already know from the internationally published literature". Profesional de la información, 2021 doi:10.3145/epi.2021.mar.08
\textsuperscript{74} Rathenau Institute, November 2021 https://www.rathenau.nl/nl/wetenschap-cijfers/wetenschappers/personeel-aan-de-universiteiten-en-umcs/tijdelijke-contracten-bij

THE PANDEMIC ACADEMIC
Since the start of the pandemic, governments, institutional management boards and policymakers have been warned that action must be taken to prevent a ‘lost generation’ of researchers (see e.g. 75 76 77 78).

Early-career researchers are very concerned about their future in academia. Stress levels and mental-health concerns were already high on the agenda before the pandemic. For most academics the pandemic further increased levels of stress, uncertainty about careers and pressure, with detrimental effects on mental health.79 The Dutch DJA-LNVH report showed that more than half of the PhD candidates, postdocs and assistant professors in tenure track positions expected COVID-related delays to prevent them from finishing their projects or meeting tenure track requirements in time.70 In a survey of 7,670 postdoctoral researchers working in academia worldwide published in Nature, 61% of the respondents reported that the pandemic had negatively affected their career prospects, and another 25% reported that its cumulative effects on their career remained uncertain.80 Indeed, since most studies currently available offer a mere snapshot of the immediate and short-term impacts of the pandemic on academic researchers, it will be important to track the degree to which its direct and indirect effects translate into changes in research funding and output and career development in the longer term. While it might take several years before we have a clear picture of the full impact of the pandemic on academics, and on distinct groups or categories of academics, many immediate effects on scholars are already evident and call for measures to support those who have been impacted most.

3.1.3 Social contact

Like most people, many academics struggled with the consequences of social distancing and sorely missed face-to-face contact and social interaction during lockdowns.81 The situation has been particularly difficult for international scholars,

78 Promovendi Netwerk Nederland, PostdocNL and De Jonge Akademie, Letter of Urgency to the Dutch Minister of Education, Culture and Science, 13 july 2020
who are far away from their relatives and home country and therefore depend even more on the academic community for social contact.

Absence of offline social interaction not only has consequences at the personal level and for mental health but may even affect scholarship as a whole. While the exact impact of the disruption of informal academic networks may be difficult to measure, the pandemic underscored their critical value for collaboration, knowledge transfer and the blossoming of creativity and innovation. Absence of offline social interaction not only has consequences at the personal level and for mental health but may even affect scholarship as a whole. While the exact impact of the disruption of informal academic networks may be difficult to measure, the pandemic underscored their critical value for collaboration, knowledge transfer and the blossoming of creativity and innovation.\textsuperscript{82} Fresh perspectives and new ideas need discussion and encouragement, a process that was hampered during the pandemic by the lack of informal interaction (and the work overload).

While listing all the negative consequences of the pandemic, we tend to forget that crises can also bring out the best in us.\textsuperscript{83} Indeed, all of the speakers at our expert session on the impact of COVID-19 on researchers mentioned how the COVID-19 crisis inspired feelings of togetherness and a willingness to help one another, especially in the first phase of the crisis. Formal and informal support from peers and mentors and activities organized to boost team morale (e.g., online coffee breaks, walking challenges, online pub quizzes) were what kept them going and strengthened their feeling of belonging to the academic community. The pandemic highlighted the value of maintaining and nurturing the spirit of solidarity among academic scholars.

### 3.2 Need for reforms highlighted by the pandemic

#### 3.2.1 Preventing a ‘lost generation’

As pointed out in the DJA-LNVH report, ‘the domain that suffered most – research – was also seen as the key domain on which respondents were expecting to be assessed by their supervisors. Teaching, management and impact were seen as much less important in that assessment’.\textsuperscript{84}

There is growing acknowledgement that traditional quantifiable output indicators (such the number of publications, first/last authorships, h-index and journal impact factor) offer only a narrow, and rather poor, definition of excellence in a system in which teaching, teamwork, management and outreach are also vital. And while the Netherlands\textsuperscript{85} and the EU are working to update the way in which academic success

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\textsuperscript{82} Dijkgraaf R. Vrees voor wetenschappelijke coronadip, column \textit{NRC}, 29 oktober 2021

\textsuperscript{83} Bregman R. Don’t forget: disasters and crises bring out the best in people, \textit{The Correspondent}, 13 March 2020

\textsuperscript{84} Bol T, Derks B, Poorthuis L. \textit{The impact of the COVID-19 pandemic first lockdown period on the work and well-being of academics in the Netherlands}. Amsterdam/Utrecht, De Jonge Akademie/LNVH, 2021

\textsuperscript{85} VSNU, NFU, KNAW, NWO, ZonMw, Position paper: Room for everyone’s talent, 2019
is defined, recognized and rewarded, these adjustments might come too late for the
generation of young researchers who suffered most from the impact of the pandemic.

Even before COVID-19, young and untenured scholars were already in a vulnerable
position, working under severe pressure and employed on temporary contracts. The pandemic merely underscored the urgent need to build a more future-proof research and knowledge climate that offers and will continue to offer young scholars an attractive work environment. Academia cannot afford a ‘lost generation’, and immediate, tailor-made action is required from academic institutions and funding organizations to help early-career scholars advance to mid-career. Such action is particularly urgent because early-career and untenured scholars were disproportionately affected during lockdowns and are likely to continue experiencing career setbacks, having missed career-defining networking opportunities and suffering disadvantages when applying for grants.

An initial wave of government funding fortunately allowed universities to offer those affected most some limited contract extensions of a few months. As the pandemic continued, however, the extensions in fact fell short of compensating for time lost. Generally speaking, they were also not granted in a way that took into account disparities in caregiving and job-related workload for specific scholars in specific situations. In addition, contract extensions are not always possible for international scholars with strict visa timelines, or because of funding restrictions or deadlines enforced by national labour law requirements, such as the Wet arbeidsmarkt in balans in the Netherlands, which forces institutions to offer staff a permanent contract once they have worked on a temporary contract for the maximum term of four years. This legislation has put some early-career and untenured researchers, particularly postdocs, in a precarious situation: if their institution has the financial means to offer them an extension making up for time lost during the pandemic but no financial means to offer them a permanent contract, they fall by the wayside.\(^\text{86}\)

\[\text{If I’m being realistic, I am not sure that PhD students will benefit from having only a three-month extension}\]

Funding agencies could introduce extension rules for researchers impacted by the pandemic that resemble the existing extension rules for applicants who have become parents (e.g., you are eligible to apply for funding X years after your PhD defence + X more years if you were a researcher during the pandemic).

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Apart from extensions, adapting the pre-COVID criteria for promotion, hiring, funding and tenure might diminish the risk that a generation of unexploited talent will be excluded from the research landscape. It is especially important that recent progress made in nurturing talent from previously underrepresented groups will not be reversed. Importantly, adjusting criteria based on what candidates have achieved under the circumstances of the pandemic, given their personal situations and the time and resources available to them, should not be confused with lowering academic standards. In addition, adjusted criteria need to be well described to ensure clarity and fairness.

3.2.2 Prioritize institutional resilience in academia

Academic institutions are and remain the designated party for selecting, supervising and supporting academic talent. To improve resilience in future crises, institutions should develop long-term coordinated strategies instead of relying on short term, crisis-driven individual coping strategies.

Developing such strategies requires some ‘breathing space’, however, i.e., enough structural funding to maintain a robust research system that limits ‘projectification’ and creates leeway for curiosity-driven research, not only because it can unexpectedly lead to very useful applicable outcomes, but also because it is necessary for maintaining a resilient research system that good researchers actually want to be part of. In the Netherlands, however, we are dealing with structural underfunding.\(^\text{87}\)

The pandemic has shown the undesirable consequences of austerity and of policies that overemphasize efficiency and accountability in public spending (most clearly in health care, but also in the education and research systems). Long-term investments in academic research are needed to create the capacity and flexibility to deal with new disruptions or crises.

Resilient institutions not only secure solid financial underpinnings (such as the ability to extend temporary contracts) but have also developed plans, strategies and processes for dealing with crises. This includes having effective staff support and HR services, having the right digital and physical infrastructure in place, training and better preparing academic leaders, and making sure that staff are not already stretched beyond their capacity by an impossible workload even in normal circumstances. It is up to academic leaders at all levels (from rectors to PhD supervisors) to reward teamwork, to encourage sharing credits for ideas and successes, to be more aware of the invisible ‘behind-the-scenes’ work, to appreciate research support staff, and to foster a sense of solidarity. Both their words and actions count and should be aligned (‘practise what you preach’). It is important, then, to foster, train and reward leadership qualities if we aim to improve the resilience of academic institutions.

\(\text{\textsuperscript{87}}\) PwC, Toereikendheid, doelmatigheid en kostentoerekening in het mbo, hbo en wo&o, 2021
While the academic research community is often described as competitive, the pandemic highlighted the importance of collaboration, mutual support, empathy and altruism in academia, qualities that form the foundations of successful and inspiring organizations. This is clearly an example of how the pandemic may have led to a change for the better.

### 3.3 Lessons learned

This chapter described two important lessons learned.

First, certain groups of scholars have fallen by the wayside. New and larger divisions have emerged in the academic community – between disciplines, between young and established scholars, between those with and without permanent contracts, between the digital literate and those less so, between those with and without caregiving duties or young children – and the various segments of that community were not all affected by the pandemic to the same extent or in the same way. Moving forward, it will be crucial to focus on creating a more level playing field in academia. Urgent action is needed to repair inequalities exacerbated by the pandemic and to prevent a ‘lost generation’ of academics. What is required is a more professional and supportive HR strategy as an integral part of every academic institution.

Second, the pandemic underscored the importance of teams and team spirit in the academic research community. Resilient research communities are not built on fierce competition and individualism, but rather on strong, solid and mutually supportive teams. The structure and culture of the organization must be adapted to recognize and reward team efforts and peer support instead of individual excellence alone.
4. IMPACT OF THE COVID-19 PANDEMIC ON RESEARCH PRACTICES

From the start of the COVID-19 pandemic, academic research was driven by an enormous societal demand. Numerous members of the research community – from across a variety of disciplines – rapidly launched initiatives to make their expertise relevant to the new situation. Funding organizations quickly arranged new funding programmes (see, for example, 88) or made it possible to redirect ongoing projects to COVID-19 (see, for example, 89), and many journals and publishers allowed free access to COVID-related articles and data (see, for example, 90 and 91). What are the short- and medium-term implications of this strong push for COVID-related research for the academic community and research practices? What lessons can we learn about more agile allocation of project funding and sharing research outcomes, and what are the drawbacks? For example, while the benefits of swiftly generating and openly disseminating scientific knowledge are widely acknowledged, there is also widespread concern regarding the quality of the information entering the public domain before undergoing peer review.92

Besides the strong push towards COVID-related research, the pandemic and the associated measures also drastically changed existing work processes and practices. The digitalization of academia accelerated rapidly. In the second part of this chapter, we consider which changes are here to stay and where action is needed to ensure that the digital transformation respects our academic values.

90 https://www.elsevier.com/connect/coronavirus-information-center
91 https://www.thelancet.com/coronavirus
92 Korteweg N. Verstopt door covid, NRC 23 October 2021
4.1 Facilitate flexibility while maintaining a broad knowledge base

In times of crises, it is important that academic researchers can have the flexibility to attribute their knowledge to the immediate urgency. This was also evident from the swift reaction of funding agencies. Additional funding was rapidly made available for COVID-related research in the Netherlands, as it was in many countries, allowing researchers to quickly generate the knowledge required by society, clinical practitioners and policymakers. During the pandemic, funding organizations developed new programmes and accelerated procedures, making huge demands on those involved. Funding applicants and reviewers worked round the clock to write, assess and later conduct research projects. Despite the heavy workload, the accelerated procedures swiftly set things in motion that usually require several months. New national and international partnerships were formed and rapidly became productive. For reviewers – who are themselves researchers and group leaders and not exempt from the struggles mentioned in the previous chapter – it was not only challenging to deal with the time pressure, but also quite a complex task to accurately judge a proposed study’s likelihood of success (e.g., inclusion rate of patients in clinical trials). Now is the time to take stock. Funding agencies should reflect on how they can encourage and facilitate researchers who wish to adapt their research to current events (e.g., by exploring ways to connect EU and national funding) while not disadvantaging researchers who are unable to do so. In addition, we recommend that funding agencies should proactively plan for future crises by addressing important questions, including how to ensure inclusiveness (e.g., during the lock downs researchers with care duties were often unable to compete), how to deal with the long-term consequences of extension rules, and how to ensure extra funding so that award-rates remain acceptable. We can learn from the challenges that have arisen in the current crisis and it would be worthwhile to reflect five years from now on the effects of current actions.

Before we dive into what is needed to make research practices more agile, we wish to emphasise that a shift in research focus must not be required from all academic scholars. After all, it remains important to maintain a broad knowledge base that allows society to address the unpredictable or long-term challenges that it will face in the future. The heavy emphasis on COVID-related research combined with drastic public health measures meant to mitigate the spread of the virus came at the expense of other urgent research activities (e.g., HIV prevention research) and shifted the attention away from other relevant breakthroughs (e.g., approval of the first malaria

93 Infographic on the COVID-19 programs of ZonMw (Dutch funding organisation)
vaccine in 2021\textsuperscript{95}). In addition, a research team's ability to quickly and successfully shift its research focus largely depends on institutional embedding: fast-track procedures leave no time to hire additional staff. Another important factor is the scholarly discipline; for example, the nature of the COVID-19 crisis made it easier for virologists to 'capitalize' on the crisis than, say, archaeologists.

4.2 Safeguarding quality under pressure

Retaining high-quality academic standards and staying true to the values of academic research are vital to maintaining trust in academia (see Chapter 2). But how can researchers and institutions do so under the pressure of an immediate crisis?

4.2.1 No shortcuts in research design

In response to the unprecedented rate at which new studies were emerging, various initiatives have been launched to maintain an overview of COVID-related research projects around the world. One example is the UKCDR and GloPID-R COVID-19 Research Project Tracker, a live database of funded COVID-19 research projects around the world (as of 15th July 2021 the database contains 12,419 projects, funded by 255 funders, taking place across 149 countries).

In addition to international tracking systems, it is important to have an overview of what is happening where at the national, regional and institutional level so as to channel resources and efforts efficiently and avoid unnecessary duplication. For example, various clinical researchers all needed access to the same patient population. Making this possible requires central coordination to avoid competition between studies and to promote well-designed, adequately powered ones. This is important, given that an assessment of worldwide COVID-19 therapeutic clinical trials in 2020 revealed that only 5% of the total COVID-19 trial arms could be described as randomized and adequately powered, meaning that the vast majority were not designed to yield actionable information.\textsuperscript{97} In contrast, several European (adaptive) platform trials, such as NOR-Solidarity, DisCoVeRy-Solidarity, RECOVERY and REMAP-CAP, have proven their worth, often building on pre-existing structures and procedures.\textsuperscript{98} This shows that it is sensible to invest during 'peacetime' in international trial and laboratory

\textsuperscript{95} https://www.who.int/news/item/06-10-2021-who-recommends-groundbreaking-malaria-vaccine-for-children-at-risk
networks and master protocols. See also 99 for a more in-depth analysis of possible improvements in data collection (and its coordination) during a pandemic.

The crisis has put the quality and rigor of ethics committees under enormous pressure. While it may feel during an immediate crisis as if there is no time to rigorously assess the power, ethics and design of a proposed study, no shortcuts should be taken here. In the end, it is always the weakest aspect of a study that determines its quality.

The following example illustrates this point. The Dutch Fieldlab experiments, set up by the Dutch event industry in collaboration with scientists and the Dutch government, have been heavily criticized. The aim of these experiments was to determine whether and how it would be possible to organize large-scale events in the midst of the pandemic, and to study the predicted rate of COVID-19 infections at different events. Although there was a pressing need for data to inform society and policymakers, the scale, timing and type of events led to a considerable public outcry, in particular owing to the lack of peer review and omissions to follow the ethical guidelines for research in the social and behavioural sciences and to make a detailed study protocol publicly available.100 As previously mentioned, transparency, open methods, open codes and open data increase the trustworthiness of research101 and are essential for a respectful dialogue and constructive criticism from peers, even – or especially – in times of crisis.

An effective way to safeguard research quality and avoid ‘sloppy science’ is to make sure that researchers are well-trained. Better training in research design improves the initial quality of research and more rigorous training in statistical methods improves the interpretation and applicability of data. This is important across all research domains. During the pandemic, we have witnessed an imbalance in the types of research directed at solving the crisis. One example is the mismatch between the number of large randomized controlled trials for drug-based interventions (such as those assessing the effectiveness of dexamethasone and hydroxychloroquine in the treatment of COVID-19) and the number of well-powered controlled trials for non-pharmaceutical interventions (such as physical distancing, face masks or patterns of school re-opening).102 Randomized controlled trials (RCTs) investigating the effectiveness of behavioural, environmental, social and systems interventions

99 KNAW. Met de kennis van straks, de wetenschap goed voorbereid op pandemieën. Amsterdam, in press, 2022
100 De Vrieze J. Get your coronavirus test, join the party: Experimental mass events in the Netherlands draw fire. Science.org, doi:10.1126/science.abj2078
102 McCartney M. We need better evidence on non-drug interventions for covid-19. BMJ. 2020, doi:10.1136/bmj.m3473
are relatively scarce; only 18 such trials were registered in April 2022, compared to 2,597 drug RCTs.\textsuperscript{103} This is possibly because non-pharmaceutical interventions are often considered incapable of doing harm, too difficult to investigate, or too obviously beneficial to bother with conducting trials,\textsuperscript{104} beyond the fact that RCTs are not appropriate for every type of research question. Thus, while evidence does not necessarily require an RCT to be considered sound, it is clear that evidence-based policymaking demands sound evidence from well-designed studies.

4.2.2 Sharing research findings

The pressing need for information during the pandemic has given rise to a massive proliferation of COVID-related articles, preprints, grants and clinical trials. By one count, from the Dimensions database, their number well exceeded 1 million in April 2022. The tidal wave of new data has forced the research community to create new platforms to coordinate, oversee and integrate rapidly emerging data. Closer investigation of the various initiatives – and what made them successful or not – is needed. See also\textsuperscript{105} for recommendations on how to organize evidence synthesis during a pandemic.

Preprints, which are preliminary reports that have not been peer-reviewed, account for a large number of COVID-related research publications. An analysis of biomedical publishing patterns shows that the volume of COVID-related publications increased sharply in the first six months of 2020, both in peer-reviewed journals and in preprint servers.\textsuperscript{106} While the increase in preprint servers occurred for both COVID-related and non-COVID-related papers, virtually all of the growth in the analysed peer-reviewed journals was due to COVID-19 papers. A minority of these, however, concerned randomized controlled trials and retrospective cohort studies, which are considered most relevant for clinicians in search of answers. An analysis by Aviv-Reuven and Rosenfeld showed that journals lowered the time to acceptance for COVID-19 papers, and that this has been (partly) at the expense of non-COVID-19 papers, whose time to acceptance was longer than in previous years (and obviously longer than that of COVID-19 papers). Thus, the focus on COVID-19 seems to have shifted the attention away from other topics, not only in the general media but also in scientific journals. Journal editors should be aware of the impact of their decisions to prioritize one topic over another.

\begin{thebibliography}{99}
\bibitem{scoreboard} Scoreboard data on: \url{https://www.bessi-collab.net/}
\bibitem{mccartney} McCartney M. We need better evidence on non-drug interventions for covid-19. \textit{BMJ}. 2020, doi:10.1136/bmj.m3473
\bibitem{knaw} KNAW. \textit{Met de kennis van straks, de wetenschap goed voorbereid op pandemieën}. Amsterdam, in press, 2022
\end{thebibliography}
An extensive analysis by Research on Research\textsuperscript{107} of how the COVID-19 pandemic impacted the scholarly communication system shows that:

- The research community has been successful in making most COVID-19 research openly and freely accessible.
- Journals managed to speed up publication times for COVID-19 articles, at the expense of non-COVID-related articles.
- The pandemic has been a major impetus for preprints, but the proportion of peer-reviewed COVID-related outputs with a preprint remains small.

Preprints can be a useful tool for rapid knowledge-sharing within disciplinary communities and offer a direct route to open science, since everyone with access to the internet can obtain a download. As stated in a recent ISC report, ‘…we all need to accept that posting preprints is now a normal part of modern research culture and an important enabler of greater efficiency, visibility and integrity in research. Preprints should be seen as just one part of a coherent move towards more open science, where we use modern technology (extraordinarily cheap digital storage and virtually free communication) to open up the research process and share a broader range of research outputs at earlier stages of our work.’\textsuperscript{108} The biggest disadvantage of preprints is that they have not been peer-reviewed, although the quality, value and reliability of peer review as traditionally organized by journals is sometimes overvalued. For example, in the midst of the pandemic even very prestigious journals such as \textit{The Lancet} and \textit{The New England Journal of Medicine} needed to retract papers because of concerns about the research.\textsuperscript{109} This example underscores the need for rigor in publishing research findings, even – or especially – in times of crisis. In addition, it shows that we need better mechanisms for retracting flawed studies \textit{and} for making researchers aware that retraction has occurred, as retracted papers continue to be cited. In addition to cleansing journals of flawed articles (which is often problematic because most journals are slow to respond to allegations and reluctant to investigate them), honourable self-retraction should be clearly indicated as such. With reference to the topic of trustworthiness discussed in Chapter 2, ‘retractions are a sign someone is paying attention, it is when you deny that problems happen that you lose trust’.\textsuperscript{110}


\textsuperscript{109} Two elite medical journals retract coronavirus papers over data integrity questions, Piller & Servick, doi:10.1126/science.abd1697

\textsuperscript{110} Quote by Ivan Oransky, a medical journalist and co-founder of Retraction Watch (source: https://healthydebate.ca/2020/07/topic/retractions-damage-trust-covid19/)
4.3 New (digital) ways of working

The changes in research practices were not only induced by the pressing need for knowledge but also by measures introduced to mitigate the spread of the virus (such as social distancing, travel restrictions and working from home). During the first lockdown, scholars swiftly learned how to use Zoom, Skype, Teams and Webex. These are just a few examples of the many digital tools that academia has come to rely on during the pandemic. Other well-known tools include online document editors (e.g. Google Docs), online virtual meeting spaces (e.g. Gathertown), various forms of conference software, social media to continue networking with peers and communicating with society (e.g. Twitter), online learning platforms (e.g. Canvas), and – controversial – tools to supervise students during exams. The digitalization of academia has taken a quantum leap during the pandemic. Many academics were naturally already very much aware that digitalization could also enable academic research, new research collaborations and new research methods, and that it can be a tool for inclusiveness, fixing inequality and increasing global cooperation while reducing the ecological footprint. Even so, the rapid digitalization of academic practices has also resulted in new digital divides and new dependencies. Research into the digital surge during the pandemic concluded that ‘[t]he pandemic has brought the world to a situation where those not connected to the internet are facing total exclusion. With strict social and physical distancing measures in place, new routines require accessing the internet for most services. Hence, those on the wrong side of the digital divide are completely left out. Reasons for the divide are many: unaffordable device access, unaffordable Internet access, content relevance, access skills or government ordered Internet shutdowns.”

As we move forward and develop strategies for new working practices, including hybrid forms, we must also pay close attention to the enabling conditions – for example, access to technology and connectivity, digital skills, and using technology in a way that is compatible with fundamental rights and academic freedoms – and the negative effects, such as workplace monitoring and technostress. While the digitalization of academia was already in the air and has only been accelerated by the pandemic, it was a leap into the digital unknown that most universities and researchers were not really prepared for, with neither readily available in-house solutions in place nor clarity as to how to navigate all the tricky technical, ethical and legal issues accompanying digitalization, including questions about privacy, security, procurement, the relationship to Big Tech and academic independence.

112 Lecture by Valentina Mazzucato, KNAW Expertmeeting Science and digital technology, 18 January 2022
4.3.1 Conferences as an example

The pandemic introduced virtual conferences to the academic community. One of the major benefits of online research conferences is the lower carbon footprint. As a report by The Young Academy shows, before the pandemic air travel accounted for a considerable share of the total CO₂ emissions of Dutch universities, with estimates ranging from 12% to more than 27%.¹¹⁴

Besides offering a climate-friendly alternative, virtual conferences are also more accessible for researchers who are unable to travel due to a heavy teaching load or childcare duties or who have fewer financial resources.

Despite these advantages, however, it cannot be denied that certain valuable aspects of real-life events are much rarer during virtual conferences. Indeed, virtual collaboration hinders a key component of creativity.¹¹⁵ As Ingrid Robeyns argues, ‘Discussions at real-life events (not just during the actual program, but equally important during the breaks and early mornings and evenings) are different – they have a depth that I have not yet seen in online discussions’¹¹⁶ Next to screen-time fatigue and time-zone scheduling conflicts, the most obvious drawback of virtual conferences is the lack of networking opportunities, and although virtual conference platforms offer some workarounds, they hardly ever live up to the quality of in-person meetings. Despite these disadvantages, most researchers think that conferences should generally have a virtual component, even after the pandemic ends,¹¹⁷ and it is therefore pertinent to consider how to blend the best of both worlds by incorporating virtual elements and in-person meetings.

4.3.2 Privacy, security and responsible use of technology

New ways of digital working also gave rise to new ethical dilemmas and vulnerabilities. A cyberattack at Maastricht University in late 2019 was an effective demonstration of how the reliance on digital technologies can make universities also more vulnerable. The debate about the introduction of online proctoring technologies for online student examination highlighted the need for a more systematic and in-depth discussion of how universities will resolve issues of privacy, transparency, autonomy and fairness when procuring and deploying digital technologies.

¹¹⁴ Flying high, but flying less, De Jonge Academie, 2020
¹¹⁶ How to make conferences more climate-friendly, Ingrid Robeyns, 2021
¹¹⁷ Scientists want virtual meetings to stay after the COVID pandemic. Nature 2021 (591):185-186 doi:10.1038/d41586-021-00513-1
Responsible use of technology, and the responsibility that universities bear to protect the privacy and safety of staff and students and carefully balance benefits against costs, are also important concerns in the transition to digitalization and the use of new digital (cloud) infrastructures. For example, a Data Protection Impact Assessment by the Dutch Ministry of Justice and Security and SURF published in early 2022 considered the professional use of Microsoft Teams and identified a number of risks and necessary mitigation measures, not only for the technology provider but also for universities. Such responsibilities can range from creating a Teams and OneDrive privacy policy for internal users and guest users to considering pseudonymous accounts for employees whose work identity must remain confidential, and from not sharing sensitive information via channels that are not end-to-end encrypted to turning off employee monitoring functionality and developing a policy of using Teams Analytics as an employee monitoring tool.

As we move forward to new hybrid forms of working, and as the use of digital technologies and AI-driven systems proliferates in research and education, universities need to be aware of their responsibilities and their duty to protect staff and students, and of the need to develop a more long-term strategic vision on the responsible use of digital technologies and how this impacts academic values.

### 4.3.3 The relationship between academia and Big Tech

The general consensus during the expert meeting was that digitalization in academia is here to stay. What this requires is a more fundamental discussion about the long-term role of digital technologies and the relationship between academia and Big Tech. Digitalization comes with surging power of large tech companies, which decide who gets access to information, guides interactions between users and converts those interactions into data. In an opinion piece, 17 rectors of Dutch universities voiced their concern about the growing dependence on commercial

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119 HOP. Court sides with University of Amsterdam on use of surveillance software. *Erasmus Magazine*, 12 June 2020

120 Hern A. Microsoft productivity score feature criticised as workplace surveillance. *The Guardian* 26 November 2020


122 Science and digital technology, KNAW expertmeeting, 18 January 2022

123 van Dijck J, Poell T, de Waal M. *De platformsamenleving: Strijd om publieke waarden in een online wereld*. 2016

platforms and how this can affect academic values such as liberty, independence and autonomy. They called for a common Dutch and EU strategy to develop alternative and responsible platforms, promote digital sovereignty and formulate conditions for procurement in relation to commercial providers. What do we need to do to ensure that the digital transition is fair, inclusive, safe and respects our academic values, fundamental rights, health and well-being?

Many of the most common technologies are provided by a handful of (mostly US-based) Big Tech companies. Universities are often unaware that the services they use simply have not been planned as public (research) infrastructures. And universities are only as resilient as the infrastructures they use. In addition, most of the services provided to universities are not delivered at the market price – if, once embedded and indispensable, those services are raised to market price, or if companies’ business models change, universities may then have to choose between dysfunction and prohibitive costs and conditions.

We must therefore pay close attention to the tools and platforms we choose as well as to the procurement terms and conditions, but we must also embark on a more fundamental discussion about the criteria and values on which these decisions are based, while keeping the bigger picture and longer term in mind. We should do more than reflect on the impact of the pandemic on the academic community, then, but also undertake action to guide the accelerated changes in the right direction.

Being locked into corporate services inevitably means being shaped by the design choices of companies

There are various alternatives out there. Surfdrive is a successful example showing that academic institutions can develop secure, GDPR-compliant and user-friendly alternatives to Big Tech platforms. Unfortunately, these alternatives often lag behind in terms of user-friendliness, reliability, scalability and functionality, and without structural investment in their refinement, they are not a serious alternative for the majority of academics, at least not yet. Conversely, the (lure of) convenience offered by the solutions of Big Tech comes at a price: structural dependence, lock-ins and loss of autonomy.

In a speech delivered during the Dies Natalis of the University of Amsterdam, Karen Maex called for a digital university act. To maintain academic independence in the digital age, she argued, it was critical to:

• Guarantee public storage and access to research data generated by universities.
• Offer free, open access to university research publications.
• Provide control over digital learning and research tools (productivity tools, learning environments, video conferencing, etc.).
• Force large (social media) platforms to offer access to the data they generate, for research purposes.

In conclusion, digital technologies have opened up new opportunities that we will not want to forego even when (or if) the world goes back to normal. They have also created new routines and structural dependencies and uncovered new challenges that we need to meet and vulnerabilities that we need to fix.

### 4.4 Lessons learned

This chapter described three important lessons learned.

First, the pandemic showed that certain processes in academic research can be faster or more efficient. We can learn lessons for more agile allocation of project funding, and quicker making results and publications available while still being careful to remain true to the values of academic research and mindful of the unpredictable benefits of basic, curiosity-driven research.

Second, academic practices have changed and there are good reasons to argue that we should not return to how things were before the pandemic but rather use this experience to create momentum for positive change. We should implement the lessons learned and rethink established practices, including moving towards more hybrid modes of working and considering new perspectives on internationalization, collaboration and conferencing.

Third, the academic community needs to reflect on the responsible use of digital technology and its growing dependence on Big Tech, a topic that must be high on the Dutch and EU agenda. Lessening that dependency may require us to invest in alternative tools and infrastructures, critically revisit the terms of procurement, and strengthen the negotiating position of universities vis-à-vis Big Tech.
5. CONCLUSIONS AND RECOMMENDATIONS

Direct impacts of the pandemic

The pandemic has stirred up the academic research community. If we want to maintain this momentum for positive change and mitigate the negative consequences, we should not ‘go back to the old normal’. For the next 24 months, universities should actively monitor over time the long-term impacts of the pandemic and the encroaching changes on researchers, academic careers, research practices and the academic community as a whole. Organizational post-COVID teams tasked with this monitoring should be installed. These teams should advise university and faculty boards directly, so they can make timely adjustments to their policies where appropriate. These teams should include members who have sufficient stature to ensure that the teams’ recommendations are given full consideration at the highest levels of the university.

Three topics should receive immediate and prolonged attention:

1. The pandemic has led to certain groups of scholars falling by the wayside. New and larger divisions have emerged in the academic community – between disciplines, between young and established scholars, between those with and without permanent contracts, between the digital literate and those less so, between those with and without caregiving duties or young children – and the various segments of that community were not all affected by the pandemic to the same extent or in the same way. Moving forward, it will be crucial to focus on creating a more level playing field in academia. **Urgent action is needed to repair exacerbations in inequalities due to the pandemic and to prevent a ‘lost generation’ of academics.**
• **Funding agencies** should include COVID-19 impact statements for new grant applications.\(^{126}\) They should also introduce extension rules for researchers impacted by the pandemic that resemble existing extension rules for applicants who have become parents (e.g., ‘you are eligible to apply for funding X years after your PhD defence + X more years if you experienced any COVID-related impact on your ability to deliver research due to external and/or personal circumstances, for example the closure of laboratories, travel restrictions or demanding caregiving duties’).

In the Netherlands the following actions can be taken to support early-career researchers:

• Next to the key investments that are made\(^{127}\) and intended\(^{128}\), we ask the **Minister of Education, Culture and Science** to ensure sufficient budget to allow universities to compensate early-career researchers specifically for time lost due to the pandemic.
  - **PhD students:** Universities and UNL should ensure that PhD students are offered an extension that truly compensates for time lost during the pandemic, because they need this time to build a solid basis for their academic careers.
  - **Postdocs:** Universities are unable to grant many postdocs extensions because certain labour law restrictions (such as the *Wet Arbeidsmarkt in Balans*) would force them to offer these postdocs a permanent contract. We urge the **Minister of Social Affairs and Employment** to make an exception for this particular group of 500 to 1000 early-career researchers,\(^{129}\) who will otherwise miss the boat. Meanwhile universities should be open to creative solutions that offer these postdocs extra time to produce the results, papers and preliminary data they need for future grant applications.

• **Universities** should develop a policy describing how to make allowance for the negative consequences of the pandemic, for example due to external and personal circumstances, in decisions concerning tenure, hiring and promotions. The pandemic has made it more difficult to compare CVs. What is required is a more professional and supportive HR strategy as an integral part of every academic institution.

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\(^{126}\) For example see: the cross funder statement on COVID-19 in future grant applications by the Academy of Medical Sciences

\(^{127}\) Ministerie van Onderwijs, Cultuur en Wetenschap, brief aan universiteiten over middelen voor herstel coronaproblematiek, 1 July 2021

\(^{128}\) Ministerie van Onderwijs, Cultuur en Wetenschap, Beleidsbrief hoger onderwijs en wetenschap, 17 June 2022

2. The pandemic shows that certain processes in academic research can be faster or more efficient. We can learn lessons for more agile allocation of project funding, and academic collaboration that we can move faster to make results and publications available while still being careful to remain true to the values of academic research and mindful of the unpredictable benefits of basic, curiosity-driven research.

- **Academic institutions** and **funding agencies** should consolidate lessons learned during the pandemic with respect to flexibility and faster procedures. What made it possible to immediately accelerate procedures and what can we learn from this? What were the drawbacks and pitfalls, and how can we mitigate them? It is important to evaluate the programmes and collect best practices and ‘do’s and don’ts’ for moving forward.

3. Academic practices have changed and researchers do not want to return to how things were before the pandemic. We should implement the lessons learned and rethink established practices, including moving towards more hybrid modes of working and considering new perspectives on internationalization, collaboration and conferencing. In particular, we need to be more aware of our ecological footprint and how new forms of working and digital technologies could present significant opportunities for change.

- **Academic researchers and their institutions** need to decide on the optimal blend of in-person, online and hybrid modes of collaboration and knowledge-sharing because the pandemic showed us that it is both possible and desirable to change our habits. This also means discussing which tools, skills and infrastructures are necessary to facilitate the new blend of modes.

- **Overarching organizations representing the academic research community** (in the Netherlands, UNL) should develop and share best practices, facilitate – where appropriate – the switch to online or hybrid modes of academic research, international collaboration and conferencing, and identify needs in terms of tools, skills and organizational support.

- **Academic institutions, acting in collaboration with UNL**, should develop a strategic vision on the responsible use of digital technology (including the question of which technologies not to use) and how to respect and protect the privacy, safety and fundamental rights of staff and students internally as well as in their negotiations with external technology providers.

- **In the Netherlands**, the **Ministry of Education, Culture and Science in collaboration with the Dutch Research Council (NWO)** should set up a dedicated funding programme for stimulating digital innovation in research and creating and maintaining digital infrastructures and open access applications and services to enable multiple modes of academic research. The government should also strengthen the negotiating position of universities when procuring third-party technology.
Never waste a good crisis, seize the momentum for change

The following three transitions had already been underway in the academic research community before the pandemic. The crisis has merely highlighted their importance:

4. **Science communication: from merely explaining facts towards dialogue**
   
   We need to seize the momentum to discuss and create the conditions for a ‘social contract’ between science, policy and society, based on mutual commitment and respectful dialogue. Not only is it important for scholars to be protected from threats, but they must also be given the space to show vulnerability, admit when a mistake has been made, and be open about how science works. Dialogue, unlike debate, explores underlying moralities – what people deem important in their relationships, in their lives, and as persons – and brings them to the surface for discussion. In particular, the firmness with which politicians make science responsible for a particular policy, can provoke incomprehension and resistance in society. That is why the role of science and scholars in policymaking and policy communication (especially in a crisis), and the inherent trade-offs between science and politics, must be constantly clarified, weighed up publicly, and made part of that dialogue.

   It is important here that scholars are aware of their own position and take responsibility for their – unavoidably value-laden – choices. At the same time, we should not be naïve about this. The pandemic has made it clear once again that science is a subject of struggle, both within the academic community and in society as a whole. More openness and better communication do not automatically protect against mistrust or politically or economically motivated attacks. Not only must science be able to show its vulnerability, but it must also be resilient.

   • **Science communication should become an integral part of academic education.** This calls for a radical rethinking of science communication and how we train young scholars, with the emphasis no longer being solely on their ability to explain, present and debate but above all on their ability to engage in dialogue, with an eye for the underlying values and assumptions of other scholars, governments and the public alike. It requires a new attitude that cannot be reserved solely for those special moments of dialogue where the government or the academic ‘listens’. Instead, listening must become part of daily practice, and that calls for training and active support and appreciation from academic and other leaders. The recently announced national science communication centre should therefore focus not only on protecting and cherishing facts but also on actively building a rapport with society through dialogue.

   • **At the same time, action must be taken to protect academics from government hostility: academic institutions** must stand behind their staff and adopt a zero-tolerance policy toward threats and harassment of researchers, with victims receiving firm support and practical help.
5. The pandemic underscored the importance of teams and team spirit in the academic research community to increase resilience: we are all in this together and can achieve a lot (under difficult circumstances) if we do it as a team. The structure and culture of organizations must be adapted to better allow for the recognition and reward of team efforts and peer support, instead of individual excellence alone.

- **University presidents and rectors** need to put their weight behind changing the way that academic staff are evaluated and supported, and make clear that every unit in their institution should incentivize solidarity and teamwork. This is crucial because diverse teams and solidarity are essential to resilient institutions; within these institutions, we need to create good leadership structures and training.

6. The academic community needs to reflect on its growing dependence on Big Tech, a topic that must be high on the EU agenda.

- **Universities** need to critically review their contracts with Big Tech organizations with view to privacy, resilience, human oversight and other factors.
- **Overarching organizations representing the academic research community** need to push for the development of procurement guidelines for Big Tech that reflect and respect academic values. They should initiate a debate on procurement conditions and terms of use, with a focus on ensuring scientific independence, resilience and values. In addition, they need to explore the use and/or development of alternative, independent digital infrastructures (Surfdrive is a successful example showing that academic institutions can develop secure, GDPR-compatible and user-friendly alternatives to Big Tech platforms).
5. CONCLUSIES EN AANBEVELINGEN (NEDERLANDSTALIG)

Directe effecten van de pandemie

De pandemie heeft veel teweeggebracht binnen de academische onderzoeks-gemeenschap. Als we het momentum willen aangrijpen om positieve veranderingen te behouden en de negatieve gevolgen te beperken, moeten we niet terugkeren naar het ‘oude normaal’. De komende 24 maanden zouden de universiteiten actief moeten blijven monitoren wat de (lange termijn)effecten van de pandemie zijn en hoe de veranderingen zich ontwikkelen voor wetenschappers, wetenschappelijke carrières, wetenschapsbeoefening en de academische gemeenschap als geheel. Er moeten post-COVID-teams worden ingesteld die hiermee aan de slag gaan. Deze teams moeten de universiteits- en faculteitsbesturen rechtstreeks adviseren, zodat zij hun beleid indien nodig tijdig kunnen bijstellen. Deze teams zouden moeten bestaan uit mensen die voldoende gezaghebbend zijn om ervoor te zorgen dat er op de hoogste niveaus binnen de universiteit geluisterd wordt naar de aanbevelingen.

Er zijn drie onderwerpen die direct én op de langere termijn, aandacht behoeven.

1. Ten gevolge van de pandemie dreigen bepaalde groepen wetenschappers buiten de boot te vallen. We zien dat er grotere verschillen zijn ontstaan tussen wetenschappers en dat de mate waarin verschillende groepen wetenschappers werden getroffen door de pandemie, sterk verschilde. Het gaat om verschillen tussen disciplines, tussen jonge en gevestigde wetenschappers, tussen mensen met en zonder vast contract, tussen mensen die meer of minder digitaal vaardig zijn, tussen wetenschappers met en zonder substantiële zorgtaken of (jonge) kinderen. Het is van cruciaal belang dat er binnen de wetenschap een eerlijker speelveld voor iedereen ontstaat. Er zijn dringend maatregelen nodig om
iets te doen aan de toename van de ongelijkheid die door de pandemie ontstond. Zo niet, dan dreigt er een verloren generatie wetenschappers te ontstaan.

- **Onderzoeksfinanciers** zouden een COVID-19-impactverklaring moeten opnemen voor nieuwe subsidieaanvragen. Ook moeten zij verlengingsregelingen invoeren voor wetenschappers die effecten van de pandemie ondervinden, net zoals de verlengingsregelingen voor mensen die een kind hebben gekregen (bijv. “u komt in aanmerking voor een aanvraag ... jaar na verdediging van uw proefschrift + ... jaar in het geval van COVID-19-gerelateerde effecten op de mogelijkheid om onderzoek te doen, als gevolg van externe en/of persoonlijke omstandigheden, zoals sluiting van gebouwen, reisbeperkingen of belastende zorgtaken”).

In Nederland zouden de volgende maatregelen kunnen worden genomen om beginnende wetenschappers te steunen:

- Naast de belangrijke investeringen die al zijn gedaan en zijn voorgenomen, vragen we de minister van Onderwijs, Cultuur en Wetenschap om voldoende budget beschikbaar te stellen aan universiteiten om beginnende wetenschappers tegemoet te komen, specifiek wanneer zij achterstand hebben opgelopen vanwege de pandemie.
  - **Promovendi:** Universiteiten moeten er in samenwerking met UNL voor zorgen dat promovendi een verlenging kunnen krijgen die het tijdverlies tijdens de pandemie echt compenseert; dit is onontbeerlijk om een goede basis te hebben voor hun verdere wetenschappelijke carrière.
  - **Postdocs:** Voor veel postdocs is het toekennen van verlenging ingewikkeld omdat – als gevolg van wettelijke beperkingen (de Wet Arbeidsmarkt in Balans) – een verlenging zou betekenen dat de instelling hun een vast contract moet aanbieden. Wij dringen er bij de minister van SZW op aan een uitzondering te maken voor deze specifieke groep van 500-1000 beginnende wetenschappers, die anders buiten de boot vallen. Ondertussen is het belangrijk dat universiteiten openstaan voor creatieve oplossingen om deze postdocs extra tijd te geven om de resultaten, papers en onderzoeksdata te produceren die zij nodig hebben voor toekomstige subsidieaanvragen.

130 Zie bijvoorbeeld de cross funder statement on COVID-19 in future grant applications van de Britse Academy of Medical Sciences.
131 Ministerie van Onderwijs, Cultuur en Wetenschap, brief aan universiteiten over middelen voor herstel coronaproblematiek, 1 July 2021
132 Ministerie van Onderwijs, Cultuur en Wetenschap, Beleidsbrief hoger onderwijs en wetenschap, 17 June 2022
De universiteiten zouden een beleid moeten ontwikkelen waarin staat hoe bij beslissingen over vaste aanstellingen, het in dienst nemen van mensen en promoties rekening wordt gehouden met de negatieve gevolgen van de pandemie wegens externe en persoonlijke omstandigheden. Als gevolg van de pandemie is het lastiger om CV’s te vergelijken. Dit vraagt om een professionelere en meer ondersteunende HR-strategie als integraal onderdeel van elke wetenschappelijke instelling.

2. De pandemie toont aan dat bepaalde processen in het wetenschappelijk onderzoek sneller of efficiënter kunnen. We kunnen lessen trekken uit de pandemie, bijvoorbeeld als het gaat om vlotte toewijzing van projectfinanciering, wetenschappelijke samenwerking en het sneller beschikbaar maken van resultaten en publicaties, zonder daarbij de waarden van wetenschappelijk onderzoek te negeren of het onvoorspelbare nut van fundamenteel, nieuwsgierigheidsgedreven onderzoek uit het oog te verliezen.

- Wetenschappelijke instellingen en onderzoeksfinanciers zouden moeten zorgen voor consolidatie van datgene wat we hebben geleerd tijdens de pandemie ten aanzien van flexibiliteit en snellere procedures. Hoe kan het dat procedures opeens veel sneller verliepen en wat kunnen wij hiervan leren? Wat waren de nadelen en de valkuilen, en wat kan worden gedaan om deze te voorkomen? De programma’s moeten worden geëvalueerd en er moeten best practices en do’s and don’ts worden verzameld om verder te gaan.

3. De wetenschap is veranderd en wetenschappers willen niet terug naar de situatie van voor de pandemie. Wat we hebben geleerd moeten we implementeren en er moet met een frisse blik worden gekeken naar de gangbare praktijk, onder meer waar het gaat om de overgang naar een meer hybride manier van werken, internationalisering, samenwerking en congresbezoek. We moeten ons vooral ook meer bewust zijn van onze ecologische voetafdruk en van hoe nieuwe vormen van werken en digitale technologieën kansen voor verandering kunnen bieden.

- Wetenschappers en de instituten waaraan zij zijn verbonden moeten keuzes maken ten aanzien van de optimale mix van onsite, online en hybride manieren van samenwerking en kennisuitwisseling, want de pandemie heeft laten zien het mogelijk én wenselijk is om onze gewoonten te veranderen. Hierbij moet ook worden nagedacht over welke instrumenten, vaardigheden en infrastructuren er nodig zijn om die nieuwe mix mogelijk te maken.

- Koepelorganisaties die de wetenschap vertegenwoordigen (in Nederland UNL) moeten best practices ontwikkelen en uitwisselen, waar nodig de overgang naar online of hybride vormen van wetenschappelijk onderzoek faciliteren, en vaststellen welke behoeften er zijn qua instrumenten, vaardigheden en organisatorische ondersteuning.

- Academische instellingen moeten in samenwerking met de UNL een visie ontwikkelen op het verantwoord gebruik van digitale technologie (met inbegrip van de vraag welke technologieën niet zouden moeten
worden gebruikt) en hoe de privacy, de veiligheid en de grondrechten van personeel en studenten te beschermen en te respecteren, zowel intern als bij onderhandelingen met externe technologieaanbieders.

- In Nederland zou **OCW in samenwerking met NWO** een speciaal subsidieprogramma moeten opzetten voor het stimuleren van digitale innovatie in onderzoek en het creëren en onderhouden van digitale infrastructuren en open access-toepassingen en -diensten om verschillende vormen van wetenschappelijk onderzoek mogelijk te maken; daarnaast zou de overheid de onderhandelingspositie van universiteiten moeten versterken bij het aanschaffen van externe technologie.

“Never waste a good crisis”: maak gebruik van het momentum om veranderingen door te voeren

Los van de pandemie zijn en blijven de volgende drie ontwikkelingen belangrijk voor de wetenschap. De COVID-crisis heeft aangetoond hoe belangrijk en nodig deze zijn:

4. **Wetenschapscommunicatie: niet alleen feiten toelichten, maar de dialoog aangaan**

Wij moeten het momentum aangrijpen om de voorwaarden te bespreken en te creëren voor een ‘sociaal contract’ tussen wetenschap, beleid en samenleving, gebaseerd op onderling respect en een open dialoog. Het is niet alleen belangrijk dat wetenschappers beschermd worden tegen bedreigingen, maar zij moeten ook de ruimte krijgen om zich kwetsbaar op te stellen, toe te geven wanneer er een fout is gemaakt, en open te zijn over hoe wetenschap werkt. In een dialoog worden (anders dan in een debat) de onderliggende waarden verkend – d.w.z. wat mensen belangrijk vinden, in relaties, in het leven, als mens – en komen deze aan de oppervlakte zodat ze bespreekbaar worden. Met name de resoluutheid waarmee politici de wetenschap verantwoordelijk maken voor bepaald beleid, roepen onbegrip en weerstand op in de samenleving. Daarom moeten de rol van de wetenschap en wetenschappers zelf bij het ontwikkelen en communiceren van (crisis)beleid, en de onvermijdelijke trade-offs tussen wetenschap en politiek, voortdurend worden uitgelegd, publiekelijk worden afgewogen en deel gaan uitmaken van die dialoog.

Het is daarbij van belang dat wetenschappers zich bewust zijn van hun eigen positie en verantwoordelijkheid nemen voor hun – onvermijdelijk waardegeladen – keuzes. Tegelijkertijd moeten we hier niet naïef over zijn. De pandemie heeft eens te meer duidelijk gemaakt dat net als in de samenleving ook in de wetenschap de meningen verdeeld zijn. Meer openheid en betere communicatie beschermen de wetenschap niet per definitie tegen wantrouwen of gerichte aanvallen vanuit een politieke of economische motivatie. De wetenschap moet zich dus niet alleen kwetsbaar, maar ook veerkrachtig kunnen opstellen.
• Wetenschapscommunicatie moet een integraal onderdeel worden van wetenschappelijk onderwijs. Dit vereist een radicale omslag in het denken over wetenschapscommunicatie en over hoe we jonge wetenschappers opleiden: ze moeten niet alleen goed kunnen uitleggen, presenteren en discussiëren, maar vooral ook een dialoog kunnen voeren, waarbij ze oog hebben voor de onderliggende waarden en vooronderstellingen bij zowel wetenschappers als overheden en het publiek. Dit vraagt om een nieuwe houding die niet beperkt moet blijven tot speciale dialoogmomenten waarbij de overheid of de wetenschapper ‘luistert’, maar dit luisteren moet deel gaan uitmaken van de dagelijkse praktijk. Dit moet dus niet alleen worden meegenomen in de opleiding maar vereist ook actieve ondersteuning van en waardering door voorraanstaande wetenschappers en andere leiders. Het onlangs aangekondigde nationaal centrum voor wetenschapscommunicatie moet daarom niet alleen aandacht besteden aan het beschermen en koesteren van de feiten, maar ook aan het actief onderhouden van de dialoog met de samenleving.

• Tegelijkertijd moeten er actie worden ondernomen om wetenschappers te beschermen tegen vijandigheid vanuit de politiek: wetenschappelijke instellingen moeten hun medewerkers door dik en dun steunen en een zero-tolerancebeleid hanteren als het gaat om bedreigingen en intimidatie van wetenschappers, waarbij slachtoffers goede ondersteuning en praktische hulp ontvangen.

5. De pandemie heeft het belang laten zien van teamwork en teamgeest binnen de wetenschap: we moeten het samen doen. We kunnen veel tot stand brengen (onder moeilijke omstandigheden) als we de handen ineenslaan. De organisatiestructuur en -cultuur moeten worden aangepast zodat er meer ruimte komt voor het erkennen en waarderen van teamwork en peer support, en niet alleen voor individuele prestaties.

• Universiteitsbestuurders moeten zich sterk maken voor veranderingen in de wijze waarop wetenschappelijke medewerkers worden beoordeeld en ondersteund, en duidelijk maken dat in alle onderdelen van hun instelling solidariteit en teamwork moeten worden gestimuleerd. Dit is van cruciaal belang omdat diversiteit en solidariteit voorwaarden zijn voor veerkrachtige instellingen; en binnen deze instellingen moeten we zorgen voor een goede leiderschapsstructuur en (bij)scholing.

6. De wetenschap dient na te denken over haar toenemende afhankelijkheid van Big Tech, een onderwerp dat hoog op de Europese agenda moet komen.

• Universiteiten moeten hun contracten met Big Tech-organisaties kritisch onder de loep nemen wat betreft privacy, veerkracht, menselijk toezicht enz.

• Koepelorganisaties die de wetenschap en wetenschappers vertegenwoordigen, moeten aandringen op de ontwikkeling van
aanbestedingsrichtlijnen voor Big Tech die recht doen aan de waarden van de wetenschap. Ze moeten de aanzet geven voor het gesprek over aanbestedings- en gebruiksvoorwaarden, waarbij wetenschappelijke onafhankelijkheid, veerkracht en waarden altijd voorop moeten staan. Daarnaast zouden zij moeten onderzoeken welke mogelijkheden er bestaan voor de ontwikkeling van alternatieve onafhankelijke digitale infrastructuren (Surfdrive is een succesvol voorbeeld dat laat zien dat wetenschappelijke instellingen veilige en gebruiksvriendelijke alternatieven voor Big Tech-platforms kunnen ontwikkelen die voldoen aan de AVG).
Annex 1. Resolution inaugurating a committee

RESOLUTION TO ESTABLISH A COMMITTEE TO STUDY THE IMPACT OF THE COVID-19 PANDEMIC ON SCHOLARS, ACADEMIC RESEARCH PRACTICES AND TRUST IN ACADEMIA

Having regard to Section 5.1 of the Academy’s Regulations, the Academy Board has resolved to establish a Committee to study the Impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia (referred to below as “the Committee”).

Article 1. Remit
The Committee’s remit is to review the positive and negative effects of the COVID-19 pandemic on scholars, academic research practices and trust in academia, as well as their longer-term consequences. The Committee will clarify what is needed to enable academic research practices to continue to flourish after the pandemic (policy for science), preferably from an international comparative perspective. It will focus on young researchers, for whom the impact is likely to be the greatest (e.g. because of the possible loss of career prospects in science in the years to come). In addition, the Committee will reflect on the role of researchers in the public domain.

The aim of the advisory report is twofold:
• to identify the impact of the pandemic – both positive and negative – on scholars, academic research practices and trust in academia.
• to make recommendations for retaining the positive effects of the pandemic for the academic community in the Netherlands and for mitigating or remedying its negative effects.
The target group consists of scientists, knowledge institutions and policymakers.

**Context**
The Covid-19 pandemic brought about many changes in academic research practices, both positive and negative. This was noticeable, for example, during the Academy’s meeting for the Behavioural and Social Sciences and Law (BSSL) Domain on 10 September 2020. Which changes do we want to keep and which do we need to discard?

Examples of positive effects on academic research practices include the extremely rapid approval of (clinical) studies, a decrease in air travel as a result of conferencing, an increase in scientific partnerships and data sharing, and the way Open Science in general has taken off. There were also negative effects, such as delays in ongoing research (e.g. as a result of postponing or cancelling laboratory studies or fieldwork and combining scientific work with care tasks at home), negative financial consequences and debates on the reliability of science.

On the one hand, the pandemic highlighted the importance of science in generating factual knowledge (to counter conspiracy theories and blind optimism) while, on the other hand, it highlighted that it was the task and responsibility of scientists to exercise due diligence (responsible research). This led to a muddle of opinion papers, many preliminary results appeared in the press without a proper peer review and many scientists appeared in the media discussing subjects outside their own field (the title of professor, for example, does not make a virologist an expert in behavioural sciences).

**Article 2. Composition and duration of appointment**
The following persons have been appointed (in their private capacity) to membership of the Committee:

**Chair**
- Natali Helberger (Professor of Law and Digital Technology, UvA, Academy member and SWR)

**Members**
- Carlijn Bouten (Professor of Cell-Matrix Interactions in Cardiovascular Regeneration, TUE, Academy member, RMW)
- Lex Bouter (Professor of Methodology and Integrity, AUMC and VU, RMW)
- Giselinde Kuipers (Professor of Sociology, KU Leuven, Academy member)
- Cyrus Mody (Professor of History of Science, Technology, and Innovation, Maastricht University)
- Hedwig te Molder (Professor of Language and Communication, VU)
- Bettina Reitz-Joosse (Associate Professor of Latin Language and Literature, RUG, DJA)
The Committee is appointed for the duration of the project involved.

Prof. Marileen Dogterom will serve as portfolio manager on behalf of the Academy Board.

The Committee will receive support from Eva Naninck (Academy Bureau) and Arie Korbijn (Academy Bureau).

Article 3. Quality and Integrity
Prior to the first meeting of the Committee, the members took note of the “Code to Prevent Improper Influence due to Conflicting Interests” [Code ter voorkoming van oneigenlijke beïnvloeding door belangenverstrengeling]; they confirmed having done so in a written statement. The Committee members familiarised themselves with the “Manual Concerning Academy Advisory and Exploratory Reports”, adopted by the Academy Board on 18 September 2017. The policy set out in that manual will be followed when assessing the draft advisory report.

Article 4. Work plan
The Committee will draw up a work plan specifying its working methods and its communication and implementation strategy.

Article 5. Fees and expenses
The Academy will reimburse the Committee members with their travel expenses but will not make any other payment to them.

Article 6. Confidentiality
The Committee members will treat all information as confidential to which they become privy while implementing this resolution and which can be assumed to be such.

Adopted in Amsterdam on 16 February 2021 by the Board of the Royal Netherlands Academy of Arts and Sciences.

On behalf of the Board of the Royal Netherlands Academy of Arts and Sciences,

M. Zaanen
General Director of the Royal Netherlands Academy of Arts and Sciences
Annex 2. Review procedure

At the request of the Academy Board, a draft of this report was reviewed by:

- Sander van der Linden, professor of Social Psychology in Society, Department of Psychology, University of Cambridge
- Belle Derks, professor of Social and Behavioural Sciences, Department of Social, Health and Organizational Psychology, Utrecht University
- Linnet Taylor, professor of International Data Governance, Tilburg Institute for Law, Technology and Society, Tilburg University

In addition, the report was reviewed by:

- The Academy’s Council for the Humanities
- The Academy’s Council for Medical Sciences
- The Academy’s Council for Natural Sciences and Engineering
- The Academy’s Social Sciences Council

The reviewers are not responsible for the final report.
Annex 3. Programmes of expert meetings

Expert meeting, 26 November 2021

Trustworthy science in the public domain

Scientific knowledge can be the subject of fierce battles, especially when it comes to how the government deals with such issues as vaccination hesitancy, climate change or nitrogen emissions. Scientists have a tendency to fall into arguments about facts and values, and to take a ‘let me explain it one more time’ approach. Ironically, social science research shows that this is actually counterproductive. That is why we must enter into a new, permanent dialogue with society in which we examine, question and discuss the interaction between values and science with an open mind. This meeting will consider the issue at hand from two perspectives. First of all, we will discuss why scientific knowledge is called into question, who does this and their reasons. Second, we will talk about what we can do to ensure that science remains credible. The speakers will give brief pitches and then enter into debate.

Featuring

Hedwig te Molder, professor of Language and Communication at VU Amsterdam, member of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator

Cyrus Mody, professor of History of Science Technology and Innovation at Maastricht University, member of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator

Natali Helberger, professor of Law and Digital technology at University of Amsterdam, chair of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia. Helberger will open the expert meeting

Anne-Floor Scholvinck, senior researcher at the Rathenau Institute, on the institute’s three-yearly surveys examining the state of public trust in science in the Netherlands

Jaron Harambam, postdoctoral fellow at the Institute for Media Studies, University of Leuven, on democratic alternatives for assessing the quality of information in the public domain

Bastiaan Rutjens, senior researcher at University of Amsterdam, on science scepticism

Ulrike Felt, professor of Science and Technology Studies at the University of Vienna, on the perspective from science and technology studies
Anna Durnová, professor of Political Sociology at the University of Vienna, on the importance of emotions

Maarten Hajer, professor of Urban Futures at Utrecht University, on the public's perception of the credibility of scientific knowledge on climate change and sustainability
Expert meeting, 2 December 2021

Impact of COVID-19 on researchers

The COVID-19 pandemic has impacted academia. The effects on researchers in the Netherlands has varied widely, however, depending on their discipline, career stage, nationality and personal circumstances.

The Young Academy and the Dutch Network of Women Professors have investigated the effects on researchers in the Netherlands. The findings and recommendations from their report will be presented during this meeting. In addition, we will reflect on the positive and negative effects experienced by junior and senior researchers themselves. We will further discuss which measures are needed to minimize negative effects and to be better prepared for similar situations in the future.

Featuring

Bettina Reitz-Joosse, associate professor of Latin Language and Literature, University of Groningen and member of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator

Natali Helberger, professor of Law and Digital technology at University of Amsterdam, chair of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia. Helberger will open the expert meeting

Thijs Bol, associate professor of Sociology, University of Amsterdam, and co-author of the report The impact of the COVID-19 pandemic first lockdown period on the work and well-being of academics in the Netherlands by The Young Academy and the Dutch Network of Women Professors

Meaghan Polack, chair of Promovendi Netwerk Nederland and PhD student in Surgery, Leiden UMC

Kari Bosch, PhD student in Cognitive Neurosciences, Donders Institute, Radboud UMC/Radboud University

Wiktor Szymanski, associate professor of Organic Chemistry, UMC Groningen and University of Groningen

Anthonya Visser, professor of German Literature, dean of the Faculty of Arts, University of Groningen
Expert meeting, 13 December 2021

Academics on fire

New knowledge that had a direct impact on society was developed at breakneck speed during the pandemic. Researchers quickly took steps to produce knowledge relevant to the new situation. What have we learned? And what price might we have paid?

We will discuss how to encourage and facilitate researchers who seek to align their research with current events, for example by quickly organizing funding. We will reflect on the quality and use of field lab experiments. We will then look at how changes in social safety influence science and researchers, and how we can continue to guarantee the quality of research, ethical and other forms of approval, publications and peer reviews in times of intense pressure.

Featuring

Lex Bouter, professor of Methodology and Integrity, Amsterdam UMC, VU Medical Centre and VU Amsterdam; member of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator

Carlijn Bouten, professor of Cell-Matrix Interactions in Cardiovascular Regeneration, Eindhoven University of Technology; member of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator

Natali Helberger, professor of Law and Digital technology at University of Amsterdam, chair of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia

Marcel Levi, professor of Medicine and chair of the Dutch Research Council (NWO), at the start of the pandemic Chief Executive of University College London Hospitals, on medical science in times of crisis

Cecile Janssens, professor of Translational Epidemiology, Emory University, Atlanta (USA), on field lab experiments

Ineke Sluiter, president of the Academy, on how changes in social safety influence researchers

Gowri Gopalakrishna, postdoctoral researcher at the department of Epidemiology and Data Science, Amsterdam UMC, VU Medical Centre, on the impact of time pressure and urgency on publication ethics and integrity
Digital technologies offered many advantages during the pandemic that we no longer wish to do without in research and education. But digitalization also poses risks to security, and to academic values, for example proctoring during examinations.

Universities are growing ever more dependent on Big Tech. Is it time for them to create a counterforce, and if so, how? The opposite side of the coin is that digitalization has made many new forms of cooperation possible, offering scientists unprecedented opportunities. Who should take the lead in developing policies to harness the potential of digital technology in this regard?

The expert meeting will consist of four brief presentations and a panel discussion.

**Featuring**

- **Natali Helberger**, professor of Law and Digital technology at University of Amsterdam, chair of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator
- **Giselinde Kuipers**, professor of Sociology, KU Leuven, Belgium, member of the Academy committee on the impact of the COVID-19 pandemic on scholars, academic research practices and trust in academia, moderator
- **Linnet Taylor**, professor of International Data Governance, Tilburg University, about security, surveillance & resilience and about academic values and digitalization
- **Thomas Poell**, professor of Data, Culture & Institutions, University of Amsterdam, about growing reliance on Big Tech
- **Valentina Mazzucato**, professor of Globalization & Development, Maastricht University, about digital technology as an enabler of new forms of (international) cooperation
- **Joris Hoboken**, professor of Law at the Vrije Universiteit Brussels (VUB), about the role of politics