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THE PANDEMIC: WHAT'S HERE TO STAY?

1. 2021

RISKS FROM THE LABORATORY?

Controlling security-relevant biological research

INOCULATION 400 YEARS AGO

How its smallpox policy kept the Qing Dynasty in power

LONG COVID

The heart after COVID-19

AFFLICTED DEMOCRACY

The coronavirus pandemic has further weakened our political system

FINANCIAL CRISIS AS BLUEPRINT?

Politics has done some things better in the coronavirus pandemic

LESSONS LEARNT

What ails the healthcare system



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MESSAGE FROM THE EDITORS



Dear reader,

We could, in fact, have known better: In 2012, the Federal Office of Civil Protection and Disaster Assistance presented a risk analysis on pandemics of the coronavirus type to the Bundestag. One which – from today's perspective – predicted later events. Although the course of events was described there in a much more drastic way, that is, as a “worst-case scenario”, being vigilant and taking precautionary measures would have been a wise move.

Epidemiologists worldwide were issuing warnings long before the coronavirus pandemic that is now endangering the whole of humanity and has caught us all off guard. And even in December 2019, when the first news about a virus that mostly affects the respiratory system started trickling in from China, it all seemed a long way away and like something that did not concern us. Then came the first lockdown in March 2020, accompanied by social distancing, masks and hygiene concepts. Culture ground to a permanent halt and pubs closed indefinitely, office work and school in front of the monitor at home became the norm, and we were obliged to cancel our business trips and holidays.

Looking back, we might rub our eyes in disbelief: The coronavirus has changed lots of things. Which of them will stay that way? What will require our attention in future? These are the questions we are addressing in this issue of *Forschung Frankfurt*, which is concerned not so much with incidence rates and R numbers, PCR tests, self-isolation and vaccination centres. The articles collated here are primarily intended to let us glance beyond the present from a social science and humanities perspective, especially by looking at past crises and pandemics.

In his article on the impact of the 2008/09 financial crisis, sociologist Markus Gangl reveals that politics was indeed quite capable of learning: Through joint

action, it was possible to keep unemployment down during the coronavirus pandemic – although the economic effects will be far more devastating than they were during the financial crisis.

An article by Iwo Amelung shows how the Manchu rulers in 17th-century China were able to consolidate their power by getting the dreaded smallpox under control. In the current pandemic too, China is acting consistently, as is only possible in authoritarian systems where civil liberties are obliged to take a back seat. The success in combatting the pandemic has boosted Beijing's self-confidence enormously. In an interview, political scientist Heike Holbig explains how. But we are also taking a look closer to home: How will the pandemic affect learning in our schools?

How have the coronavirus restrictions affected the way we deal with death and mourning? And how can the health system be better prepared for future crises? When we decided back in the autumn of 2020 to devote an issue of *Forschung Frankfurt* to the pandemic, we by all means had our reservations: Perhaps this would all be water under the bridge by the summer of 2021? In the meantime, the third wave of the coronavirus pandemic is behind us, and we are hoping that a fourth wave triggered by dangerous mutations is not just around the corner.

One way or another, the topic of pandemics will continue to occupy us for a long time to come – in particular because we want to be better equipped for the next one. Science can make an indispensable contribution in this context, as many encouraging examples of outstanding research work at Goethe University show.

We wish you insightful reading!

Anke Sauter and Markus Bernards
Forschung Frankfurt Editorial Team

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REASONS OF STATE IN THE PANDEMIC

Chinese Perspectives

Interview with political scientist Heike Holbig about China's successful politics in relation to the pandemic

The coronavirus started off from China on its victory march around the world. After initial chaos, the autocratic regime quickly had the pandemic under control, and the aspiring superpower seems to be emerging from the crisis stronger than before. Which experiences can be transferred?

The images from China at the beginning of the crisis were alarming. The health system seemed to be collapsing. How could this news get out?

Heike Holbig: Yes, the images were alarming. Back then, such scenes still seemed a long way away for us. Unlike those from the European hotspots, however, such images from Wuhan only came in the first weeks of 2020, that is, before the country's strict censorship took hold. Like terrorist attacks or natural disasters, epidemics are also a highly sensitive topic in China, and disseminating corresponding information is reserved for party-state media at the highest level. Local reports and ones by those directly affected are unwelcome because they are suspected of stoking rumours and triggering panic. Maintaining social stability is the top priority.

The images of the countermeasures were also dramatic: People were unable to return to their homes, others were not let out. There was a lot of criticism about these repressive measures in the country itself too.

At least in the case of epidemics, which measures can be classified as "repressive" and which as "resolute" is rather a question of perspective and previous experience. In democratic Taiwan too, quarantined households were electronically "sealed" to prevent infected people from leaving their homes. Here, as in China and neighbouring countries, the SARS

"Xi Jinping only went into action on the frontline once things started turning for the better."

epidemic in 2002/2003 has left lasting memories and heightened acceptance towards infection control and prevention measures. It was therefore not so much the strict measures that were criticised, but rather the initial cover-up of the new disease and the delay in introducing infection control measures which went on for weeks. While Hong Kong, Taiwan and Singapore had already imposed restrictions on entering the

country at the turn of the year, Mainland China only began implementing consistent measures in the last week of January, after human-to-human transmission had been officially confirmed there. These included cordoning off Wuhan and other cities in Hubei Province with over a million inhabitants, strict curfews and rigorously monitored isolation and quarantine measures.

Who held the reins?

The party-state leadership under Xi Jinping set up a central leading group for the fight against the coronavirus epidemic as well as an inter-ministerial coordination mechanism to align measures undertaken by all the 32 ministries involved in the areas of infection control, prevention and production of protective equipment as well as mitigation of economic losses. Premier Li Keqiang was entrusted with heading the central leading group. His deputy, Sun Chunlan, was dispatched to Wuhan to coordinate measures at local level. As long as the situation was not yet under control, government representatives were sent

Applause for the head of state: Xi Jinping walks past rows of delegates at the Chinese People's Political Consultative Conference. His crisis management was criticised at the beginning, but he is now styling himself as a valiant commander-in-chief in the fierce war against the virus.

on ahead. The media only reported on party leader Xi Jinping going into action on the frontline once things started turning for the better.

The Chinese government declared a national crisis. Was that supposed to help contain the pandemic or domestic criticism?

Both. On the one hand, the purpose of declaring a national crisis was to mobilise

journalists, intellectuals in the public sphere, but also high-ranking party representatives accused above all central government's leaders and Xi Jinping personally of having deliberately covered up the outbreak of the epidemic, reacting far too late and thus of having run the risk of the virus propagating on an epidemic scale. When, at the beginning of February, the *Wall Street Journal* called China "the real sick man of Asia", alluding to the social Dar-

In the meantime, we no longer hear anything from domestic critics.

The most vociferous critics were arrested, some sentenced to imprisonment or banned from publishing. Domestic critics are gagged – and this in social media too – with the intimation that they are playing into the hands of hostile forces from abroad and betraying national interests. As far as we can judge from here, the indignation, boosted by propaganda, at what is perceived as undue criticism from the West by all means ensnares people.

How did the state apparatus get the population behind it again?

Firstly, presumably through the effectiveness of the measures. The number of infections in Wuhan and the surrounding cities was already under control by mid-March, and at the end of March it was possible to end the lockdown and the economy gained momentum again. Media coverage plays an important role in this, whether non-stop videos on state television showing how hospital construction in Wuhan is progressing or the styling of Xi Jinping as a valiant commander-in-chief in the fierce war against the virus. However, the best publicity for its own epidemic control were the pictures from Italy, Great Britain, Iran and other regions of the world where the virus claimed far more lives in a short space of time than it did in China. The news from the USA under President Trump, who first gambled away precious time and then failed entirely in the fight against infections, was grist to the Chinese party-state's mill and restored its lost legitimacy. When it then transpired in the second half of 2020 that China would emerge from the pandemic as one of the few economies worldwide with economic growth of over two per cent, this is likely to have reconciled most people with their political leaders.

What do you think: Do people in China believe the government's propaganda or are they primarily afraid of reprisals?

In general, it's likely that most of the population is very well aware that they are dished up a streamlined "published opinion" in the state media that is prop-



Press unwelcome:
On 3 February 2021, a WHO team arrives at the Wuhan Institute of Virology to investigate the origin of the coronavirus. A security guard denies journalists access.

Photo: picture alliance/ASSOCIATED PRESS | Ng Han Guan

extensive material and human resources as quickly as possible. We learned how two hospitals were built in Wuhan within just ten days. Equally remarkable, however, are the partnerships between 16 hotspot cities in Hubei Province and 16 other Chinese provinces, which were organised centrally and obliged to send medical personnel, apparatus and protective equipment to the respective partner city. In this way, it was possible to compensate swiftly for bottlenecks in the health sector like were happening in Europe. On the other hand, the national crisis also served to contain criticism from at home and abroad, which reached a peak around the Chinese New Year. Online

winist vocabulary of the 19th century, that was the final straw: The article was indignantly dismissed, and three WSJ correspondents had their accreditation revoked. This indignation and the orchestration by the media of the people's wrath are also an integral part of the national crisis.

"The indignation, boosted by propaganda, at what is perceived as undue criticism from abroad by all means ensnares people."

agandist and heavily edited. However, the search for alternatives is difficult because the Western media have lost credibility. Even before Trump, US-American, European and especially also German reporting on China was often perceived as one-sided. The Western press finally gambled away its reputation once fake news became the norm under Trump. During the pandemic, China's state media systematically borrowed from Western media debates: Foreign criticism of China was dismissed as "fake news", international "conspiracy theories" were debunked with pro-government "fact checks". Under such circumstances, harsh repressive measures to make the population behave in the desired way are not necessarily needed – it's enough just to discredit alternative interpretations from at home and abroad.

"It's enough to discredit alternative interpretations from at home and abroad."

Officially, there were only 100,000 infections in China overall, and at just around 5,000 the number of dead is comparatively low. How credible do you think these figures are?

There is no absolute certainty, but at any rate a lot of testing was done, and this made it possible to quickly contain smaller local outbreaks. The low number of cases, especially in terms of deaths, is likely to be reliable and at least follows the trend, also in view of the fact that other East and Southeast Asian countries, such as South Korea, Taiwan, Singapore or Japan, were also relatively successful in containing the pandemic.

What can we learn from China?

What we certainly CANNOT and do not want to learn is its authoritarian approach to dealing with criticism and information or the state-integrated deployment of state-of-the-art surveillance technology in private domains. In a positive sense, we could learn how to make sufficient hospital and staff capacities available quickly or how to establish routines



Comprehensive preventive measures were also taken outside the hotspot cities in Hubei Province directly affected by the epidemic – like here in the megacity of Shanghai.

in testing and tracking infection trajectories and digitalising healthcare in order to address the critical bottlenecks in contact tracing with which our public health departments are still struggling to this very day. However, these techniques have been used not only in China but also in other East Asian countries. The successful countries do not share the same authoritarian one-party system as China, but they do share a developmental state tradition.

What do you mean?

Characteristic of this tradition are a long-term pursuit of nation-state development goals under central control and close interrelationships between political, bureaucratic and entrepreneurial forces that can also be activated at short notice. This allowed the production of masks and test kits to be ramped up very quickly during the pandemic, as democratic South Korea has taught us. South Korea has also set standards in the testing and tracking of infected persons and some of these standards could also be compatible with the data protection expectations of European societies. And finally, we can learn that it's important to learn long-term lessons from a pandemic. Because of their experience with

SARS and MERS, these countries had a head start. We ought to have the same head start in the next pandemic.

"The successful countries do not share the same authoritarian one-party system as China, but they do share a developmental state tradition."

The EU has recently decided on sanctions against China because of the human rights situation there. Is it possible to make an impression on China's leaders by banning them from travelling abroad and blocking their accounts?

Well, the sanctions have certainly made an impression on China's leaders, otherwise they wouldn't have reacted so incisively with countersanctions. But the question is whether the EU sanctions will have the intended effect. As far as human rights are concerned, for example, Chinese officials are now mounting a full offensive: In a showdown with US



Built from scratch in ten days:
The aerial photo from
2 February 2020 shows
Huoshenshan Hospital in
Wuhan, which was built
solely for the fight against
the coronavirus.

Photo: picture alliance/Photoshot

Secretary of State Anthony Blinken in mid-March 2021, top diplomat Yang Jiechi accused the USA of neither representing international public opinion nor being authorised to demand compliance with universal values on behalf of the entire Western world. They should, continued Yang, rather take care of the human rights violations taking place at home that have come to light through the “Black Lives Matter” protests. These comments are not only of a tactical nature to show that China is no longer going to let itself be intimidated by the West. They must also be understood as a strategic signal that China is no longer prepared to acknowledge Western sovereignty in the interpretation of universal values and global norms. We’re dealing with a counterpart that sees itself not only on the road to success in terms of *realpolitik* but also as morally superior, if not even also superior as a civilisation.

“A counterpart who also sees itself as morally superior, if not even also superior as a civilisation.”

China’s rulers are using the failure of the West to master the pandemic to present their own system as superior. How successful are they in this?

In the eyes of China, Western liberal democracies have failed miserably in fighting the pandemic. As a Chinese colleague expressed it, the political elites there are “worried” about the proper functioning of Western states, which are less and less in a position to “deliver”, that is, provide essential public goods for the broad population. I can’t gauge how that resonates with the Chinese popula-

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tion. In view of massive propaganda and censorship, critical voices are being heard less and less; trips to China are no longer possible due to the pandemic. I suspect that the feeling of moral superiority really does ensnare the population, also because it promises to heal the old inferiority complex that has accompanied and shaped the process of Chinese nation building since the mid-19th century. The danger of this metamorphosing into a nationalistic superiority complex cannot be brushed aside.

“In a sense, the Chinese party-state is coming into its own during the crisis.”

In conclusion, can we say that China has emerged from the pandemic stronger than before and has improved its status in the world?

In its self-perception, China has gained considerably in status. Like the financial crisis, the current global coronavirus crisis has given China a boost at international level – but the pandemic is not over yet. As we are painfully discovering, our federal institutions and democratic processes with their inherent need for coordination are proving sluggish and partly counterproductive. In contrast, the Chinese party-state is coming into its own during the crisis, as it were, by creating legitimacy for itself, at least at home, through a strict and comparatively effective pandemic response regulated from the top down. It remains to be seen how much recognition it will reap for this on the international stage



Photo: picture alliance/Xinhua News Agency | Ju Peng

at the end of the day. While some Asian neighbours and African and Latin American partners are paying tribute to China's leaders for their resolute control of the pandemic, vaccine diplomacy and self-confident performance in the area of foreign policy, the country's international status seeking is increasingly meeting with resistance in the West. The pandemic seems to have triggered a spiral of escalation from which the parties involved are finding it more and more difficult to extricate themselves and work together on mastering global challenges.

The interview was conducted by Anke Sauter.

Via video call, Xi Jinping, head of state and party leader, talks to patients being treated for COVID-19 at Huoshenshan Hospital. The pictures are intended to demonstrate that he cares about local concerns in the dramatic fight against the virus.


About Heike Holbig



Heike Holbig is professor of political science with a focus on Chinese and East Asian area studies at the Faculty of Social Sciences. She also teaches and is a researcher at the Interdisciplinary Centre for East Asian Studies. In the framework of her studies in sinology and economics, she spent two years in Beijing between 1989 and 1991 and has since travelled regularly to China for field research and conferences. While research visits on social science topics had been taking place under difficult political conditions for several years

already, travel to the People's Republic has not been possible at all since the outbreak of the pandemic and will remain so until further notice. Examining China's political, economic and social developments in (post-)coronavirus times can therefore almost only take place from an external perspective. This makes a comparison with China's East Asian neighbours and the experiences of other countries in dealing with the pandemic all the more important.

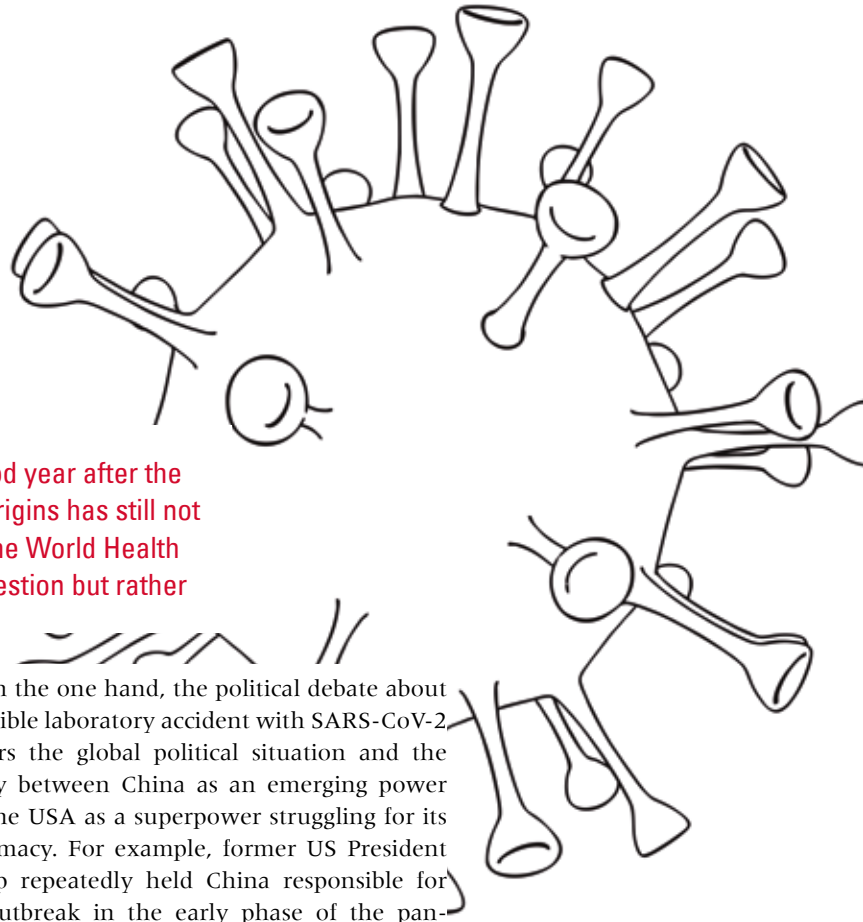
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Risks from the laboratory?

On the nexus of biosafety, biosecurity
and pandemic preparedness

By Una Jakob



Natural outbreak or laboratory accident? Even a good year after the COVID-19 pandemic began, this question about its origins has still not been clarified once and for all. An investigation by the World Health Organisation earlier this year did not resolve this question but rather raised new ones.

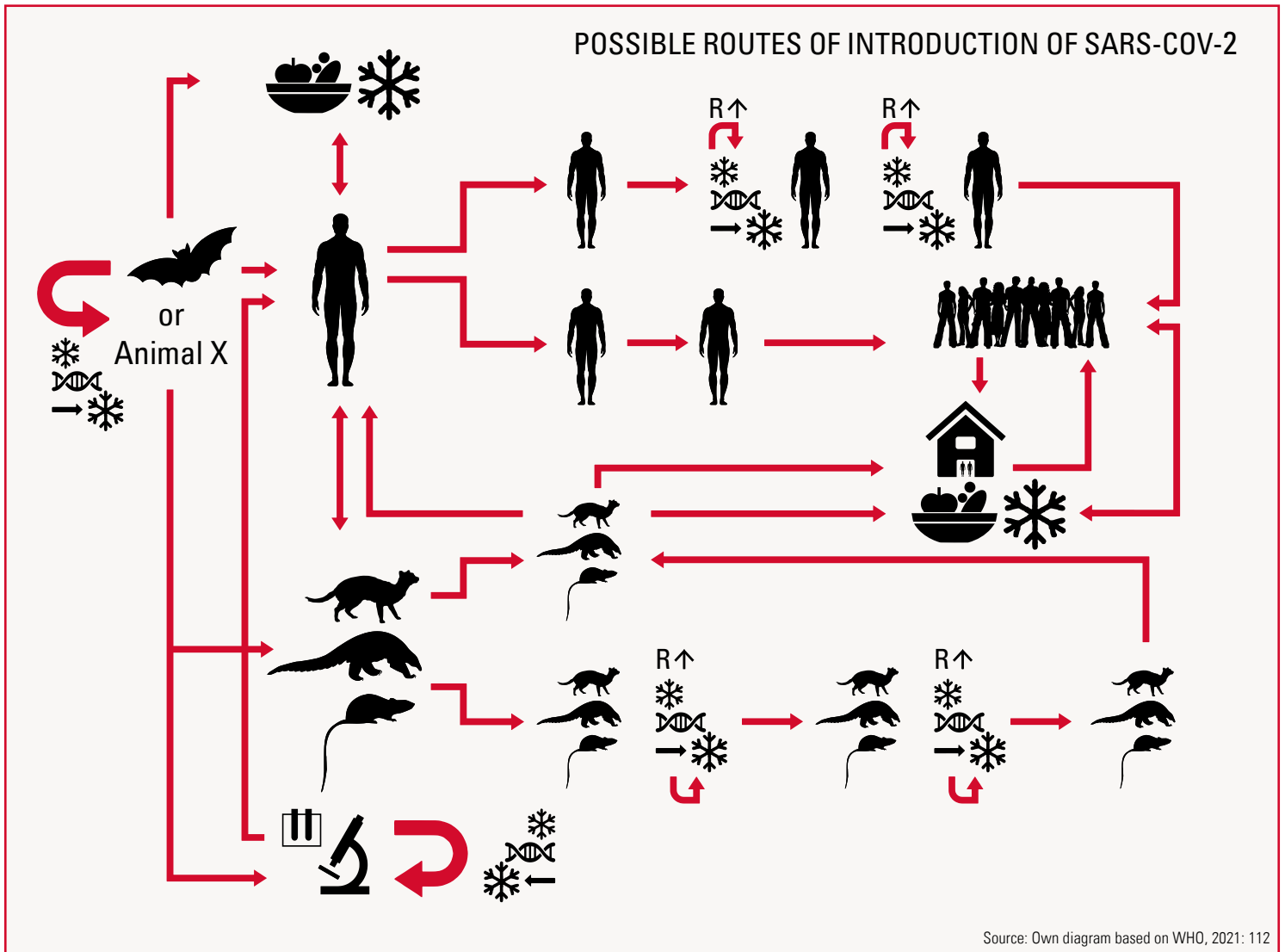
The WHO investigation carried out in January 2021 was preceded by a long preparatory process. In May 2020, the World Health Assembly (WHA) through WHA Resolution 73.1 tasked the WHO (World Health Organization) to investigate the origin of the pandemic. In January 2021, after protracted preparations and negotiations on modalities and access, a team of international experts from various pertinent disciplines travelled to Wuhan in China, where the origins of the COVID-19 outbreak had been suspected. Together with Chinese experts, the team investigated whether the pandemic could be traced back to a natural outbreak through direct transmission from bats, a natural outbreak via an – as yet – unknown intermediate animal host, contamination of frozen food or a laboratory accident. The latter hypothesis is the most sensitive politically: the question whether the pandemic was caused by the accidental release of the SARS-CoV-2 pathogen from a Chinese research laboratory. China has vehemently rejected this allegation and has, in return, suggested that the virus could have originated outside China (e.g. Molter/DiResta, 2020). While some scientists were convinced early on that this was a natural outbreak (Andersen et al., 2020), others had at least discussed the possibility of an accident and called for an international investigation (Lentzos, 2020). The WHO team's official report was published at the end of March 2021, but it did not produce any conclusive results (Lentzos, 2021). Although a laboratory accident is described in the report as highly unlikely, at the press conference on the occasion of the report's publication the WHO's Director General stated that further investigations in this regard were still needed (WHO, 2021a, b). Thus the origin of the pandemic remains unknown.

On the one hand, the political debate about a possible laboratory accident with SARS-CoV-2 mirrors the global political situation and the rivalry between China as an emerging power and the USA as a superpower struggling for its supremacy. For example, former US President Trump repeatedly held China responsible for the outbreak in the early phase of the pandemic. The current US administration, together with 13 other countries, has criticised the fact that the WHO team did not have access to all available information in the course of the investigation, by implication accusing China of not having cooperated sufficiently (USA, 2021). Moreover, US President Biden recently instructed the US intelligence community to investigate the origin of the pandemic more closely; China meanwhile continues to criticise such statements as being politically motivated (Hunnicut and Bose, 2021)

Biosafety and biosecurity – concepts at the interface of security and health

On the other hand, the debate about the origin of the pandemic is part of the international and interdisciplinary discussions on biosafety and biosecurity in which the international security, global health and life sciences communities have engaged for several years. The term "biosafety" denotes measures to avert the accidental release of pathogens from laboratories, and "biosecurity" means preventing unauthorised access to such pathogens. Among many other issues, these discussions have addressed the question of how to handle research activities which pursue beneficial and legitimate goals but at the same time harbour a high potential for misuse or harm if the pathogens under study are deliberately or accidentally released.





Where could the novel coronavirus have originated? The diagram shows the possible routes of introduction investigated by the WHO

Such research is referred to as “Dual Use Research of Concern” (DURC). In biology, DURC experiments often relate to the field of genetics and genetic engineering, especially in “gain-of-function” research. Here, pathogens are modified in such a way that either some of their properties are artificially altered (e.g. enhanced pathogenicity or person-to-person transmissibility) or new properties are added (e.g. resistance to drugs) (see Casadevall/Imperiale, 2014). Various synthetic biology experiments have also been criticised as (too) dangerous, such as the reconstruction of the “Spanish Flu” virus that triggered a devastating pandemic in 1918–1920 or the synthesis of a virus that is related to the smallpox virus (Koblenz, 2020). DURC experiments are often conducted to better understand the nature of dangerous pathogens and to be able to assess and reduce the risk of pandemic outbreaks more effectively. In the process, however, more dangerous pathogens can be created which, if deliberately or accidentally released from the laboratory, could trigger

precisely those hazards they were supposed to reduce. This risk renders such research a security issue in the context of biosafety, biosecurity and biological risk reduction.

The spectrum of biological risks

Biological warfare, that is, the use of diseases or toxins as weapons, has been known for centuries. For example, during the siege of the city of Kaffa on the Crimean Peninsula in the 14th century, besieging troops are said to have catapulted the corpses of plague victims into the city. In the 18th century, in the course of the colonisation of North America, British military personnel issued blankets and clothing contaminated with smallpox to Native Americans (Wheelis, 2001). The aversion against and prohibition of such warfare can be traced back just as long. The use of biological weapons is universally and globally outlawed today. For almost 50 years, the Biological Weapons Convention (BWC) has moreover prohibited the possession, production and transfer of biological weapons for its current





Working under difficult conditions: the WHO's scientific delegation outside the fish market in Wuhan.

Photo: ulistein bild – AP

183 member states. A research project at the Peace Research Institute Frankfurt (PRIF) is examining the question of whether this prohibition can now also be considered a norm under customary international law.¹

Non-compliance with the ban on bioweapons has been rare (see Carus, 2017). However, due to changing political circumstances and technological developments, bioweapons could become an option in the future for countries that would not shy away from norm violations. To date, there are only isolated examples of attempted or actual terrorist attacks with pathogens or toxins. These include, for example, the “anthrax letters” in the USA in October 2001 or the foiled attempt in Cologne in 2018 to disperse the plant toxin ricin via an explosion. Some transnational terrorist organisations are also said to be interested in biological weapons

(Lentzos 2020). The technological hurdles for synthesising or modifying pathogens for terrorist use are very high. Access to such pathogens stemming from DURC experiments might possibly represent a desirable option for terrorists or criminals. Since such experiments are usually carried out under high safety and security precautions, illicitly acquiring such pathogens is difficult and accidental release improbable. Accidents with pathogens nevertheless have occurred repeatedly (Furmanski, 2014), and DURC experiments might be conducted even more frequently in future considering the current pandemic experience. Effective and appropriate biosafety and biosecurity measures should therefore be discussed and introduced early on.

The keywords “biosafety” and “biosecurity” encompass issues that were originally tackled in separate research areas. The containment and prevention of infectious diseases falls within the scope of global health promotion and research. Protection against the accidental release of dan-



¹ <https://www.hsfk.de/en/research/projects/projects/the-prohibition-of-biological-weapons-a-norm-of-customary-international-law>

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Delegates of the 2019 BWC Meeting of States Parties in Geneva.

gerous pathogens moreover touches on questions related to occupational safety. Preventing unauthorised access and deliberate spread also calls for action in the areas of law enforcement, judiciary and security policy. Preventing the use of diseases as weapons ultimately requires diplomatic, intelligence and defence efforts. Together, these topics span the entire spectrum of biological risks – from natural disease outbreaks to laboratory accidents, criminal activities, bioterrorism and state-run bioweapons programmes.

In political practice, this is reflected, for example, in a shift in the discourse within the institutions for biological disarmament. As the author has explored in a project in the frame-

work of the “Normative Orders” cluster of excellence in Frankfurt², the key issues in the diplomatic efforts concerning biological arms control have continuously moved away from classical biological disarmament over the last 20 years: State-centred, binding transparency and verification measures were largely sidelined, and countries have increasingly concentrated on national preparedness for and defence against biological risks across the entire spectrum instead. International cooperation in the peaceful use of the rapidly developing fields of biology and biotechnology, including to promote global health, is playing an increasingly important role. This brings us back full circle to the question of how to deal with DURC as an important and at present controversial aspect of biosafety and biosecurity.

IN A NUTSHELL

- Even after a WHO investigation, it remains unclear whether the COVID-19 pandemic originated from a natural outbreak or a laboratory accident.
- Pandemic research often includes security-relevant experiments in which pathogens are synthesized or modified.
- Their unintentional release is one of the biological risks on a spectrum ranging from natural disease outbreaks to laboratory accidents, criminal or bioterrorist activities and state-run bioweapons programmes.
- The question of the origins of the COVID-19 pandemic must therefore also be seen in the context of the global debate on biosafety and biosecurity, that is, efforts to contain these risks.
- To improve international biosafety, interdisciplinary research from the perspectives of the natural, social and legal sciences is needed.

Enhancing biosafety and biosecurity requires interdisciplinary research

On the basis of the information currently available, it is impossible to tell whether the COVID-19 pandemic outbreak originated from a natural outbreak or a laboratory accident. To answer this question, further independent investigations would be necessary, which would have to be conducted without the limitations set by the WHO’s mandate and with extensive access rights. The results of such investigations could yield important insights, beyond the specific case in hand, into how the risk of a pandemic could be minimised in future and how risks in security-relevant research could be better assessed and reduced.

Studying these topics and devising policy options require an interdisciplinary approach to the topics of biosafety and biosecurity from the perspectives of the natural, social and legal

² <https://www.hsfk.de/en/research/projects/projects/from-biological-disarmament-to-biosecurity-securitization-or-humanization-of-biological-weapons-control-after-september-11-2001>

sciences. To name just a few important topics: It could, for example, be explored whether globally harmonised standards and regulations could sustainably improve biosafety and biosecurity, that is, protection against all the biological risks outlined above, and how such standards and regulations could be agreed upon. This includes making laboratories safe and secure, as well as strengthening international bioweapons control. Criteria for a risk-benefit assessment in DURC experiments would also have to be defined on an interdisciplinary basis, carefully

balancing the goals of minimising the potential risks of biological research and of avoiding undue restrictions on the freedom of science. The results from such research could also help prepare and support political decisions.

The current pandemic highlights areas in which further research would be necessary in order to be better prepared for similar events – not only in terms of health but also (bio)safety and (bio)security policy. Hopefully, the pandemic experience will provide the incentive to tackle this work. ●

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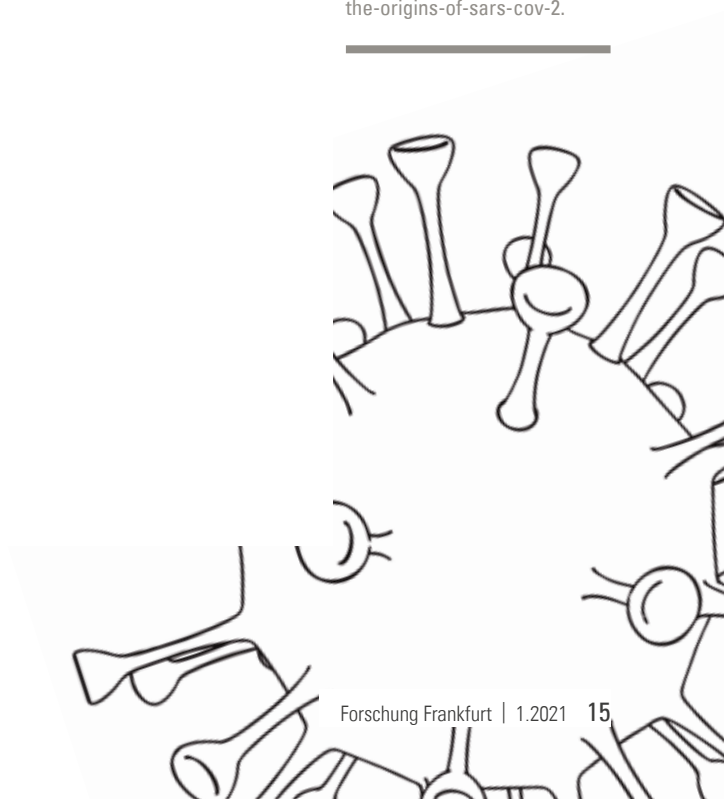
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1 Physicians in beak masks are characteristic of medieval plague control even today. In fact, they were rarely used – except in satirical poems and drawings.



Habit des Medecins, et autres personnes
qui visitent les Pestiferes, Il est de
marroquin de leuant, le masque a les yeux
de cristal, et un long nez rempli de parfums

Who will defeat the Black Death?

The legal profession and the rise of public disease control in the early modern period

By David von Mayenburg

In the late Middle Ages and early modern period, jurists played a growing role in combatting the plague: While medical experts argued about whether bodily fluids were to blame for the spread of the plague or contact with the sick, legally educated officials organised an unprecedented policy of state intervention for their rulers. This strategy was successful, but at times brutal.

An outbreak of plague and its consequences – Altdorf 1606

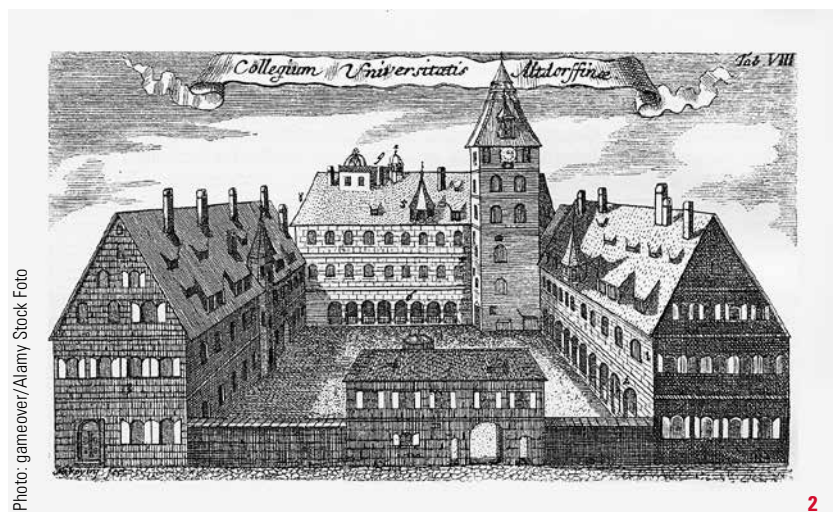
In 1606, the small university town of Altdorf near Nuremberg (Fig. 1) was startled by disturbing news: The plague had broken out in the neighbourhood and it was feared that it would soon reach Altdorf as well. People were aware that a possible plague outbreak posed a deadly threat. After a respite of many centuries, the plague had reappeared in Europe in 1347, and since then it had ravaged almost all regions of the continent. So it is not surprising that the students of Altdorf hurriedly packed their things and left the city to wait in as isolated a place as possible for the outbreak to end. The students' worries were justified: Only a few days later, the plague claimed its first victims in Altdorf, among them the famous professor of medicine Nikolaus Taurellus.

The prominent death seemed to confirm the students' decision to flee the city. But the longer the lecture halls remained deserted, the more impatiently some professors pressed for a return to university life. The most prominent voice to emerge was a professor of law, the university's vice-chancellor Konrad Rittershausen (Fig. 2). In a hastily printed appeal, he sharply attacked the students who had fled: By fleeing, they had

become the easy prey of a rumour. Rumours, however, were much more infectious and harmful than the plague. Against the advice of his medical colleagues, Rittershausen called on his students to return immediately to the classroom.

The case of Altdorf exemplifies the often difficult relationship between medical and legal experts in questions of epidemic control, even today. It prompted the project that provides the

2 Stay away or attend in person? A question that already led to differences of opinion between students and professors in the Franconian university town of Altdorf back in 1606.



2

Photo: Fama De Pestilentia Altorfina, 1607/Universität Rostock



3a

Photo: Johann Jakob Heald/Wikimedia Commons



3b

3a+b Rumours are more infectious than the plague: It was with these words that Konrad Rittershausen, jurist and vice-chancellor of the University of Altdorf, urged students to return.

basis for the following interim results, exploring the question of how legal experts in the Middle Ages and the early modern period reacted to the plague, how they interacted with other experts, and what significance legal expertise had for the rise of the modern health state.

The Black Death – the hour of the medical profession

To understand the medieval medical strategies for combatting the plague, one must be aware that the complex ways in which the disease was transmitted from rats to fleas to humans were unknown until the turn of the 20th century. The external symptoms of the disease were the only empirical evidence, along with the fact that it could spread very quickly within human communities as well as from village to village, and town to town.

As early as 1348, the medical faculty of the University of Paris published a study on the plague, which was to become extremely influential as “The Report of the Paris Medical Faculty”. In the sense of the classical medicine of Galenos of Pergamon, the disease was seen as the result of decomposition processes of rotting matter. According to this conception, the substances released by these processes, so-called miasmas, led to disturbances in the balance of the bodily fluids. Appropriate precautions were derived from this: While the creation and spread of miasms was to be prevented by removing waste, keeping the air clean and fumigating houses with fragrant herbal vapours, the bodily fluids were to be strengthened by healthy behaviour in eating, drinking and sexuality.

This medical canon of plague control quickly spread throughout Europe in a plethora of plague tracts. Originally intended for communication within the medical profession, demand

also came from wider sections of the population. This was because the preventive and curative recommendations of the doctors were primarily directed at the individual, who was partly responsible for any disease through his or her behaviour. This literature initially consolidated the role and reputation of doctors as plague experts. Especially in times of plague threat, more and more cities afforded themselves a city physicist. The professionalisation of the health service was thus not only part of a secular modernisation of public administration in the course of the pre-modern processes of state formation, but increasingly also a reaction to the sporadic plague epidemics.

Legal plague expertise?

What role did jurists play in this context? Their early involvement in public and ecclesiastical administration certainly gave them a certain starting advantage. As learned councillors, judges or notaries, they gained access to the levers of power. But were they also qualified to deal with epidemic-specific issues?

Undoubtedly, the plague epidemics generated legal questions from the 14th century onwards: Should the unwieldy formal requirements for drawing up wills be suspended in times of epidemic? Were women allowed to administer the sacraments when there was a shortage of priests? Were medical staff allowed to leave the hospital and flee during an outbreak of the plague? Legal opinions and administrative records show that questions of this kind were relevant. The learned jurists, however, dealt with this kind of question only casually. It was not until 1523/24 that two legal treatises on plague appeared in quick succession, one by Gianfrancesco Ripa from Pavia and the other by the Bolognese jurist Girolamo Previdelli. If one looks through these very extensive writings, two aspects in particular stand out:

On the one hand, an attempt is made to comprehensively illuminate plague law. However, both writings concentrate on a few main points, in particular the effects of the plague on contract law, procedural law and above all testamentary law. The broad field of public hygiene is addressed selectively, but clearly takes a back seat to civil law aspects.

On the other hand, the texts as a whole appear rather conventional, even by the standards of the time. It is clear that lawyers always first define traditional law as the fixed point of their considerations. However, the opportunity to use the plague outbreaks as a starting point for a formative reform of the law, for its further development and adaptation to the needs of the time, is quite obviously missed. The authors almost fearfully insist on the rules of the tradi-

tional legal system, preferring to play down the plague rather than use it as a reason for opening up the law or even for social reforms. Previdelli, for example, raises the question of whether, in addition to the citizens of the city, the scholars of the local university could also be obliged to stand guard at the city gate to prevent infected persons from entering – a question of solidarity in times of need. The author, however, takes the view that university privileges are more important than needs during hardship. For one thing, the plague was ultimately not that bad, the necessary guards would certainly be found. On the other hand, the differences between the estates had to be preserved even in times of need: Guard duty was dirty work (*vile officium*) and beneath the dignity of a scholar.

Despite, or perhaps because of this basic conservative tone, these two plague treatises were a great success, at least within the legal profession. It seems as if everything was laid down in them that seemed worth knowing for the jurists of the following centuries in matters of plague.

The hour of the jurists: shifts since the end of the 16th century

It was not until the end of the 16th century that the history of legal plague expertise gained a new dynamic – one which, however, was less attributable to the growing importance of the law than to specific weaknesses of medical plague control. Over time, various circumstances had contributed to its delegitimisation. Doctors were suspected of greed, and satirical poems and drawings (which, incidentally, also depicted the beak masks of the plague doctors, which were rarely actually used, Fig. 3) increased; however, comparable criticism was also levelled at the lawyers. More serious were the failures in combatting the plague. The miasma theory was widespread, according to which diseases such as the plague were transmitted by an undefined type of matter that arose through rotting processes in air and water. It became clear, however, that the miasma theory, while coherent in itself, simply did not fit the empirically experienced consequences of the plague. Instead, it became increasingly clear that the plague was transmitted from person to person – which confirmed the minority medical opinion of contagionism. This scholarly dispute was elementary for the practice of combating the plague: While the miasmatisers advised cleaning the cities, cleansing plague-infested houses, banishing beggars and prostitutes, but also pigs and everything else “unclean” from the communities, and purifying the air by fumigation, the measures of the contagionists were primarily aimed at cutting off transmission routes, sep-

arating the sick from the healthy and isolating those suspected of having the plague. Corresponding measures already existed in the 15th century in some North Italian municipalities. In practice, it is true that from the very beginning, people never adhered exclusively to any of these dogmas and took measures against contagion very early on. (The term quarantine was allegedly coined in Ragusa as early as 1377.) However, many practitioners, especially jurists, had

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- The rivalry between the medical and legal profession regarding the correct approach in a pandemic is not new. A legal history project at Goethe University takes a closer look at the situation in the Middle Ages and early modern era.
- In contrast to modern medicine, physicians at that time did not know what caused the plague. The disease was viewed as the result of a disruption in bodily fluids due to decomposition processes in the environment. The efforts to combat this included the fumigation of homes and encouraging people to adopt healthy lifestyles.
- As early as the 14th century, however, jurists were involved in matters of the plague, which is documented by writings on contractual, court and testamentary law. Initially, however, they did not take advantage of the opportunity to use the pandemic to further develop the law.
- In the 16th century, the jurists' importance grew, due in particular to the failure of traditional medicine to cure the disease. On the basis of the theory of contagion, which was critically regarded in classical medicine, lawyers took the lead in an administration that did everything in its power to cut off transmission routes and isolate the sick.
- From this time forward, combatting the plague was increasingly a question of organisation. The role of jurists gained significance, which is expressed particularly clearly in the guide on combatting the plague by Girolamo Gastaldi from 1684. Gastaldi considered the medical profession incompetent and relied on a consistent, sometimes ruthless, policy of isolation and quarantine.

5 The plague in Rome was fought by setting up special hospitals, cordons and strict controls. According to Gastaldi's plans, even a half-finished prison (the Carceri Nuove) was to be used as a plague hospital. Its layout made it possible to separate the sick and the healthy.

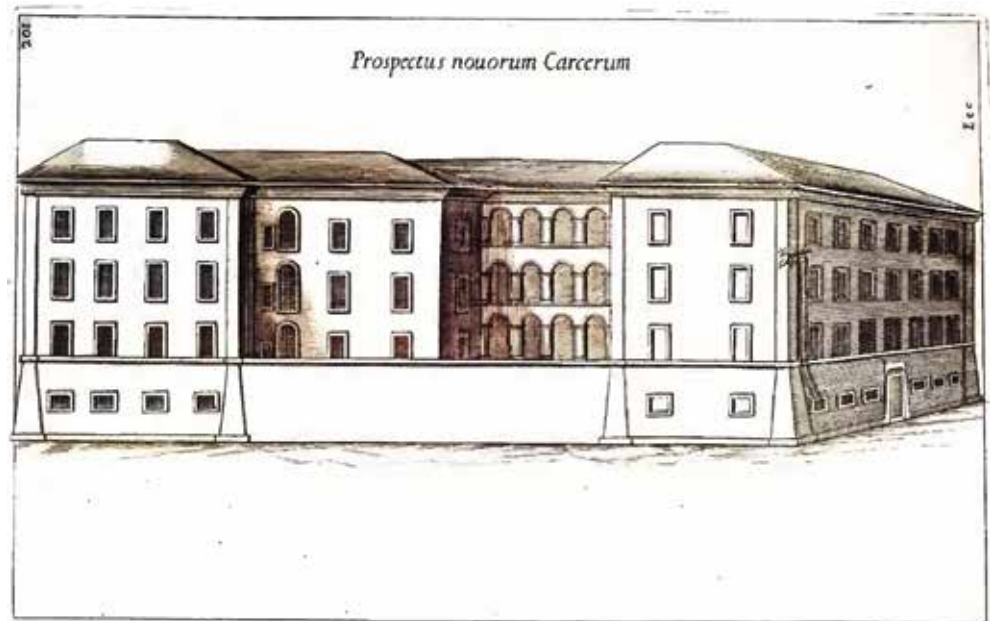


Illustration from: Gastaldi, 1684, p. 201

less trouble embracing contagionist concepts than their colleagues in medical faculties.

Thus, the Bremen city physician, who had a legal education as well as a medical one, developed a systematic plan for the prevention and management of plague crises. His plague treatise, which was published in 1582 in Latin and one year later in German, represents the start of a paradigm change, also in Germany. From then on, it was less about instructing the individual to live a healthy and sinless life than about planned sovereign organisation. The measures proposed by Ewich are not that different from the strategies currently chosen to combat the coronavirus:

The inhabitants are to be ordered to observe the following rules, namely to avoid all public gatherings, such as weddings, theatre performances, choirs, public baths, busy markets, elaborate funeral celebrations. Church gatherings, however, may take place if they are spread over different places and people do not dine and sit

closely together. Busy schools should be moved to suitable places with ventilation. Less busy schools and primary schools are to be closed until the disease stops raging. (Translated from the German version of this article.)

Ewich became a city physician because of his medical expertise, but his legal education enabled him to break through medical dogmas in favour of a planned organisation of the world. However, Ewich could do little with his classical jurisprudential knowledge here. Rather, behind his desire to control chaos through clever laws, one can discern a legal mind interested in legal policy and building on the human gift of order.

Jurists as plague experts – Girolamo Gastaldi's plague manual from 1684

How much ground jurists had gained over physicians becomes even clearer in another plague control manual (tractatus de avertenda et profliganda peste politico-legalis), a monumental tract of over 900 pages published in Latin in Bologna in 1684. Its author, Girolamo Gastaldi (Fig. 4), had studied law in Pisa. Elected cardinal in 1643, Pope Alexander VII gave him an important job in the Sanità, the Papal health authority. This body had been convened again in 1656, when the plague was rolling towards the Holy City from Naples. Gastaldi and his colleagues at the Sanità devised an ingenious system to contain the threat of infection. The land and sea borders of the Papal States were sealed off. Goods and people were turned away at the borders, supported by a system of passes organised by papal notaries. Sanità officials combed the streets and investigated rumours of plague infections. Doctors examined the sick and divided them into categories. Those infected with the plague were sent

4 For jurist Gastaldi, the medical profession was incompetent as far as the plague was concerned: To prevent contagion, he called for a change of approach in the fight against the plague. He enjoyed the trust of Pope Alexander VII, who wanted to protect the "Holy City".



Photo: BTEU/AUSMUM/Alamy Stock Foto

4

to a hospital on an island in the Tiber, those suspected of being infected with the plague to another infirmary outside the city (Fig. 5). Those who were on the mend were taken to another hospital, where they remained interned until they recovered. The houses of plague patients were sealed and disinfected with smoke. All markets, schools and churches remained closed, all public gatherings were banned. As a deterrent, gallows were planted all over the city to hang quarantine breakers and other people who defied the strict laws.

Even if the effectiveness of these measures is still debated today, contemporaries at least perceived it that way, and Gastaldi's manual became a great success. It was repeatedly emphasised that the severe plague wave of 1656 and 1657 had caused significantly fewer deaths in the territory of the Papal States than in other areas of Italy.

Even the jurist Gastaldi, who by his own account had little medical knowledge, clearly preferred a contagionist line. He openly denied the medical profession any competence in the

matter of the plague. They had neither preventive nor curative successes to show. It was better to leave recovery to nature than to the art of healing. Gastaldi pleaded for a change of system: If flight and isolation of the individual were to be regarded as the most effective means, then an efficient epidemic policy had to aim at preventing infection. The plague was thus no longer a problem to be solved medically, but rather in terms of legal policy. Gastaldi presented his plan, which had proven itself in Rome, down to the smallest detail, including drawings for the architecture of the plague houses and lazarets. The numerous decrees and edicts of the Pope from the plague period serve as blueprints to spell out the sometimes drastic measures in legal terms. This master plan not only leaves theological and medical tradition behind, but canonical tradition as well. God no longer appears at the beginning of the reflections as the controller of all events. And one also looks in vain in Gastaldi's treatise for the common law with its countless citations and cross-references. It is a deeply political, in fact a science-political writing, in which the radiant figure of the Pope is no longer staged as God's representative and ruler over the globe, but as a clever sovereign whose measures prevailed in competition with those of other territories – perhaps with God's help, but beyond doubt through the application of reason.

The fact that this strategy always carried with it the dark side of modernity should not be concealed. This is evident not only in the brute force with which Gastaldi's measures were enforced, but also in the particularly high death toll in Rome's Jewish ghetto, which was cut off from the outside world and left to its own devices, without regard to the spread of the disease. In the Papal States, too, humanity and mercy quickly found their limits where they stood in the way of efficient state action. ●

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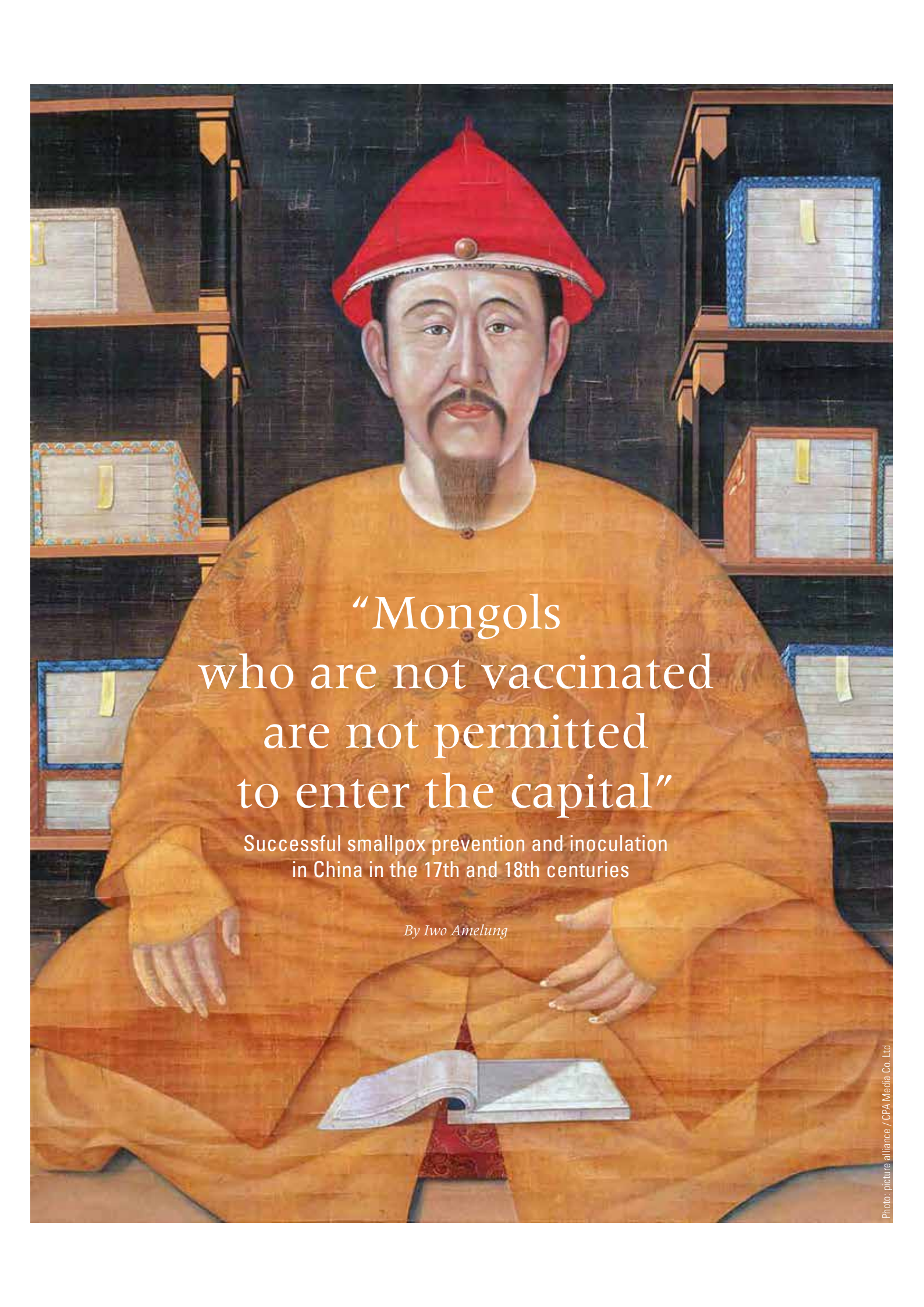


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David von Mayenburg, born in 1968, first studied history in Munich and Oxford. After completing his master's degree in 1995, he went on to study law in Bonn. After the two state law examinations, he earned his doctoral degree in law in 2005 with a thesis on the history of criminology. His post-doctoral degree (Habilitation) on the legal history of the peasants' war of 1525 followed in 2012. After a year as an associate professor at the University of Lucerne, he has been professor of modern legal history, history of canon law and civil law at Goethe University since 2014. His research priorities lie in pre-modern legal history, especially classical canon law, and the history of criminal law. He is the editorial director of the forthcoming handbook on the history of conflict resolution in Europe, a sustainability project of the LOEWE priority programme "Extrajudicial and Judicial Conflict Resolution".

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“Mongols
who are not vaccinated
are not permitted
to enter the capital”

Successful smallpox prevention and inoculation
in China in the 17th and 18th centuries

By Iwo Amelung

Over 100 years before Edward Jenner, people in China were already being inoculated quite successfully against smallpox. The purpose was not only health protection. Dealing with epidemics was a political process.

In 1644, the Manchus began to conquer the whole of China. A momentous event: The Manchus, who had formed out of predominantly Tungusic ethnic groups, were to rule the Chinese Empire as the Qing Dynasty until the 1911 Revolution, whereby in 1644 presumably less than two million Manchus faced a Chinese population of over 130 million. An equally major challenge for the Manchus as this enormous discrepancy were the foreign pathogens for which their immune system was not prepared. Such encounters have repeatedly led to catastrophes, as was the case, for example, with the Native Americans (McNeill, Diamond).

The Manchus' susceptibility to the "civilised" diseases of the Chinese was comparable to that of the Native Americans. Yet how did they manage to escape a similar fate and maintain their role as leaders until the turn of the 20th century? The question of how the Manchus in the late Chinese Empire dealt with smallpox – "the greatest killer" (Donald Hopkins) – deserves our attention, independently of the current pandemic too.

The Manchus' fear of smallpox

Smallpox seems to have been endemic in China since the 4th century. Chinese society attempted to come to terms with its existence early on: It was regarded since the Song period as a periodically erupting, highly contagious and extremely dangerous childhood disease. For the Tungusic peoples living in the northeast, however, smallpox was something referred to as a "virgin soil epidemic" (Crosby). The Manchus and their allies were aware early on of the danger of infection. Their leaders developed concepts to prevent contagion. They even forewent military action if there was any indication of smallpox cases among their opponents. For certain military operations, only troops were deployed that

were already immune. Nevertheless, there was a markedly large number of victims among the Manchurian population as well as among the ruling elite. A Korean visitor to the old Manchu capital Mukden (Shenyang) noted: "Smallpox is the great taboo in this state [...] it is considered a very serious crime if you are discovered to have smallpox and not to have reported it immediately, [...] those who conceal smallpox are sentenced to death."

Preventive measures

Awareness of their own susceptibility led the Manchu leaders to adopt comprehensive and systematic measures. At the beginning of the conquest, these were in the first instance quarantine and segregation. Quarantine here meant that the Emperor and other high dignitaries



Photo: privat

confined themselves to a protected location in the event of a smallpox outbreak. Access to these "smallpox shelters" (*bidousuo*) was only possible with special precautions. The Emperor's ceremonial and administrative obligations were scaled back as far as possible. During the reign of the Shunzhi Emperor (1644–1661), at least nine smallpox outbreaks occurred in the capital Bei-

The Kangxi Emperor at the age of 45, painted in 1699. He was the fourth ruler of the Qing Dynasty and the second Qing emperor to rule China itself. Kangxi's reign lasted 60 years, the longest of any Chinese emperor. Having contracted smallpox himself as a child, he later advocated the inoculation of children.

A statue in front of the Centre for Health and Disease Prevention in Luoyang (Henan Province) shows how variolation was done.

jing; each time the Emperor withdrew to the *bidousuo*. The Kangxi Emperor (the Shunzhi Emperor's son), who reigned from 1662 to 1722, spent the first six years of his life in a *bidousuo* outside the Forbidden City.

Segregation was also part of the safety concept of the early Qing rulers. In 1645, for example, all sick people and their families were obliged to leave the capital – something that led to great suffering. At their destinations at least 40 *li* (20 km) outside the capital, people were unable to find accommodation. Many were so poor that they could not afford to move elsewhere and in some cases were forced to leave their children behind or even sell them. To avoid deportation, some families abandoned their children at the first signs of smallpox. As unrest grew, measures were softened.

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- When the Manchus started their conquest of China in 1644, they not only had to gain control over a population far superior to themselves in terms of numbers but also faced challenges as a result of smallpox, for which their immune system was not prepared.
- The Manchurian Qing Dynasty, which occupied the Chinese imperial throne until 1911, developed comprehensive measures to prevent the disease. In particular, the emperor and other dignitaries were strictly segregated. Sick people were obliged to leave the capital; the Chinese inhabitants were resettled elsewhere.
- The Chinese have known a kind of inoculation since the 16th century: The aim was to achieve immunity through deliberate infection with weakened smallpox pathogens, a method known as variolation. The Kangxi Emperor was the first Manchu to use this practice on his own children.
- The treatment was successful – even if not comparable to today's vaccinations in terms of its effectiveness. Through the members of the Royal Society of London and Lady Montagu, wife of the British Ambassador in Constantinople, variolation became known in Europe.
- The successful and resolute handling of smallpox was an important pillar that enabled the Qing Dynasty to further expand its strong rule over China.

The Manchus had already implemented similarly strict and ruthless measures during smallpox epidemics in their home territories. In the new capital Beijing, tensions between the local population and the Manchu banner armies grew. As a consequence, the Chinese population was resettled away from what was referred to as the “inner city” to the southern part, which also reduced the risk of infection.

Even before conquering all China, the Manchus had already established their own administrative body for measures intended, in the narrower sense, to prevent epidemics. Its members, as what were known as “smallpox investigation officers” (*cha dou zhangjing*), held responsibility and power after 1644 too. Despite all these precautions, the future Kangxi Emperor contracted the virus as a child, yet survived the disease largely unscathed. By contrast, his father, the Shunzhi Emperor, caught it and died of smallpox at the age of 22. Seven-year-old Kangxi succeeded him. Adam Schall von Bell, the Emperor's Jesuit advisor, had recommended that only a child who had already survived smallpox should be made ruler. We know from written sources that Kangxi had smallpox scars, which are not, however, visible in portraits painted of him.

Inoculation

During his 60-year reign, the Kangxi Emperor created the foundation for China's incredible boom in the 18th century. In 1680, his son Yinreng fell ill with smallpox. He learnt from a low-ranking official called Fu Weige about the method of human-to-human transmission of smallpox pathogens with the intention of inducing a controlled infection to create immunity, a method known as variolation, which in China today is referred to as *rendou jiezhong fa* (“inoculation method with human smallpox”, but frequently in early sources as *dou zhong* – “implanting smallpox”). Variolation had been known in China since the 1560s and was used above all in the south. The Emperor had his own children successfully inoculated with this method.

Science historian Joseph Needham, who is inclined towards the superlative, considers “variolation” to be the origin of immunology. Indeed, knowledge of the immunity created by overcoming a disease forms the basis for the assumption that an intentionally induced infection could serve the same purpose. However, variolation is far from being a precursor of modern immunology. Traditional Chinese physicians mostly assumed that smallpox developed out of a “foetal toxin” (*taidu*), meaning that the pathogens were in the body from birth. One popular, morality-steeped conjecture targeted excessive

sexual desire at the time of conception as the cause, while another brought into play poisoning from meconium. "There are people who claim that if you give a child a particular medicine, it will never in its whole life fall ill with smallpox. How could that be? Smallpox is at rest in the body from the beginning and does not move," physicians argued. The counterargument given to these early anti-vaxxers: Yes, the pathogens are indeed located in the body, but certain circumstances are necessary in order to trigger an uncontrollable outbreak of the disease. Inoculation, they said, was about prompting existing pathogens to cause a controlled infection and thus creating lifelong protection against smallpox.

In the Qing period, four methods can be distinguished:

1. *Wet inoculation method:*

Wet cotton is impregnated with an extract of pulverised smallpox scabs and inserted for six hours in a nostril of the child to be inoculated.

2. *Dry inoculation method:*

Slowly dried smallpox scabs are ground to a fine powder and then inserted in the nose with the help of a silver tube 20 cm long; the right nostril for girls and the left one for boys.

3. *Clothing method:*

The vaccinee is wrapped in the clothing of a person with smallpox.

4. *Lymph method:*

Cotton is soaked in pus from smallpox blisters and inserted in the nostril.

The *Imperially Commissioned Golden Mirror of the Orthodox Lineage of Medicine* compiled in the middle of the 18th century considered the second inoculation method to be the most tried and tested. However, all the procedures were handed down orally and exclusively by experienced physicians. The origin of this secret knowledge is not known. At the end of the 18th century, Jiao Xun, a renowned scholar, commented as follows: "This technique is indeed extremely subtle. It equates with the idea contained in the 'Inner Canon of the Yellow Emperor' that the holy being cures a disease before it breaks out. But ignorant people do not share this opinion and wait until the poison breaks out on its own, depending on the seasons, [other] epidemics and the spirits. [...] Why do we not destroy it before it flourishes and chase it away to a place where it can be prevented?"

Only children were inoculated, the risk for adults was too high. The quality of the material used for inoculation was crucial: "Once you have collected the smallpox scabs, they should be carefully wrapped in paper and put in a small bottle. This should be closed tightly with a cork so that the *qi* does not escape. The bottle

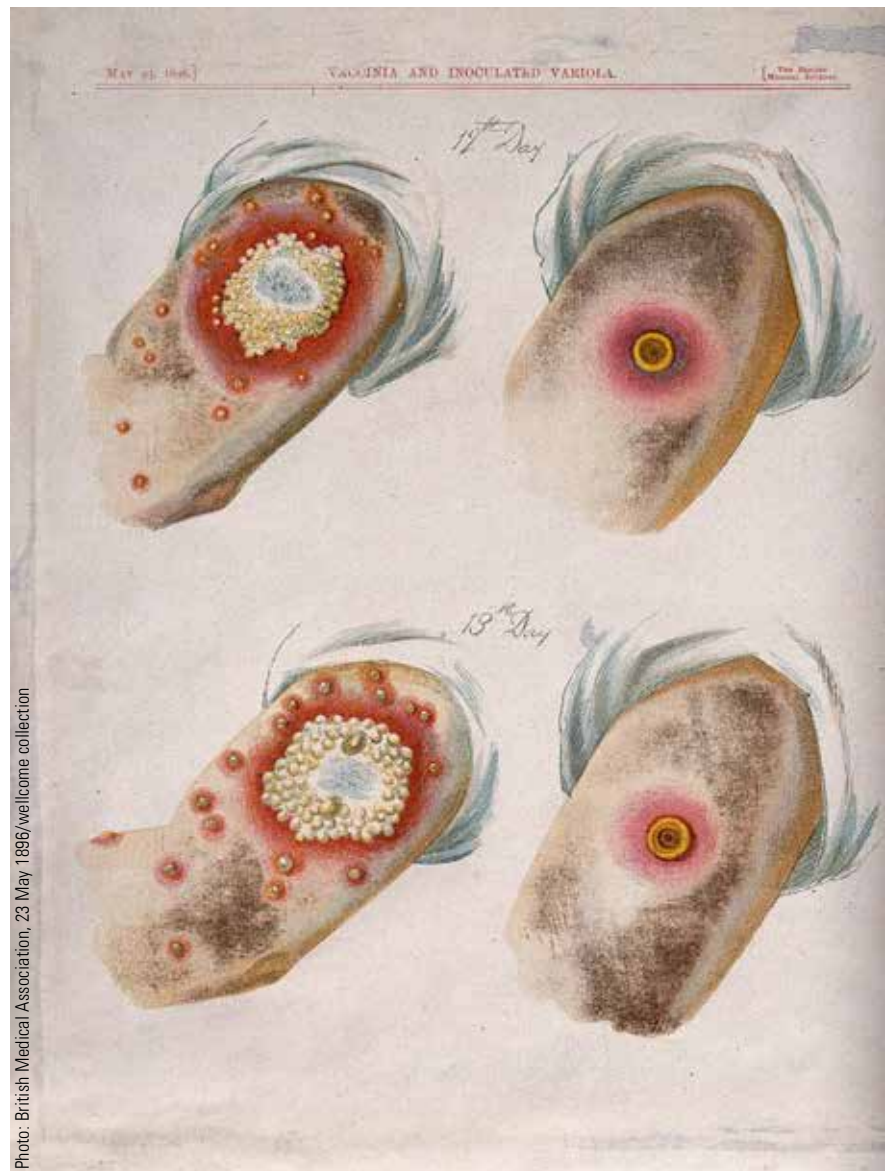


Photo: British Medical Association, 23 May 1896/wellcome collection

should not be exposed to sunlight nor heated up near a fire. It is best for a person to wear it on the body so that the scabs dry naturally." A widely used method was to obtain vaccine from the scabs and blisters of successfully inoculated individuals. Here too, the vaccinator's experience was of vital importance. Scabs from smallpox on the head were of the best quality, those from the hands, feet or chest area should not be used.

In view of the existential threat, the whole topic was linked to religious notions from an early stage. The folkloric belief in the smallpox goddess *Doushen niangniang* spread as far as the Imperial Court. Sacrifices had to be made to the goddess both in the event of a smallpox infection as well as for inoculation. For inoculation, an auspicious day had to be chosen, paper money had to be sacrificed and the family had to avoid inauspicious words so as not to displease the smallpox goddess.

Comparison of blisters after inoculation with human smallpox and cowpox on the 12th and 13th day after administration.



An officer of the Qing Army.
Ink and paint on silk,
Metropolitan Museum of Art,
New York.

How efficient and safe were the vaccines?

Renowned physician Zhang Yan said in the 18th century: "I've travelled throughout the whole country and inoculated no less than 8,000 or 9,000 people. All in all, it was no more than 20 or 30 that I was unable to save," and Zhu Chungu, who was in charge of administering vaccinations on behalf of the Qing Court, reported a death rate of less than one person per hundred people inoculated. Given the 30 per cent lethality of smallpox and the social impact of smallpox epidemics, these figures represented tremendous progress. However, inoculation could also trigger epidemics in the first place. There are reports, for example, of an attempt to inoculate a family's children that led to the annihilation of the entire family.

A smallpox department was added to the Imperial Academy of Medicine as early as the 17th century, and it was staff from this department who administered vaccinations to Manchus and Mongols – something especially close to the Emperor's heart. In 1708, the Kangxi Emperor informed the Mongols in a certain region that vaccinators would go there and that the Mongols should have all children aged six and seven inoculated. "Those among the Mongols who are not vaccinated are not permitted to enter the capital. If they are later infected during a natural smallpox epidemic, they must die without question."

Indeed, this imperial activism in relation to vaccinations contributed significantly to reducing infant mortality and thus, as historian Zhang Jiafeng assumes, also to consolidating Manchurian rule. From the middle of the Kangxi reign onwards, there is no longer any evidence of the complex measures to prevent smallpox beyond inoculation that had still characterised the Shunzhi Emperor's reign. Nonetheless, another Manchurian emperor, the Tongzhi Emperor, is said to have died of smallpox at the end of the 19th century – although it could also have been syphilis. More difficult to determine is the inoculation status of the population as a whole. In the 18th century, presumably 80 to 90 per cent of the elite in the south of the Empire were inoculated. For ordinary people, having their children inoculated seems to have been too expensive. On the other hand, there are reports of philanthropic institutions that financed the inoculation of poorer classes, like in England.

Even today, it has not yet been conclusively decided whether variolation was indeed developed in China, as postulated by Needham and Chinese historians, or whether it in fact originated in India. Equally controversial is the question of how the "Chinese" method influenced developments in other parts of the world. It is known that the variolation method rapidly

gained currency in Europe in the 18th century and that various ruling houses there ensured that their members were inoculated. This is often credited to Lady Montagu, wife of the British Ambassador in Constantinople. She had seen a local physician practising the method there and then had her own children vaccinated, which saw to the popularisation of the method in Europe from 1714 onwards. In fact, however, a letter from China describing the Chinese practice had already reached the Royal Society of London in 1700, and a lecture on the subject was given at the Society in the same year.

How the method could have reached Turkey from China is also unclear. Perhaps from Russia: Shortly after the Treaty of Nerchinsk of 1689, which established the borders between the Qing Empire and Tsarist Russia, Russian students had travelled to Beijing to learn not only the language but also the practice of smallpox inoculation. Variolation quickly spread around the world and was also used in America from 1721 onwards. In December 1721, a fierce debate erupted in New England between “anti-inoculators” and “inoculators”. In the 1760s, the Catholic Church in France spoke out explicitly against inoculation, partly because it saw it as playing with God’s will.

Nonetheless, variolation in Europe and America in some ways paved the way for the spectacular success of Jenner’s smallpox vac-

ination. In China, however, there was still a preference for variolation in many places even in the 19th century – something now criticised as a dangerous “superstition” by Western observers endeavouring to propagate the smallpox vaccination based on cowpox.

The history of smallpox inoculation in China is a fascinating example of the historical handling of epidemics that shows: This is an eminently political process. Given their great susceptibility, for the Manchus it was, of course, a matter of pure survival. But the methodical and resolute handling of the threat in the early phase of their rule also attested to the Manchus’ political capacity to act – which facilitated their rule over China and large areas of Inner and East Asia that lasted for over 260 years. ●

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The author

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SCHAFFEN



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Behind a mask, at a distance or in digital space

Where can people meet up in times of the pandemic and how can lively get-togethers take place?

By Dirk Frank

The coronavirus pandemic has led to a massive drop in physical encounters and meetings. But what does it mean to meet our fellow human beings solely in Zoom conferences, with a mask and at a larger distance – or not to meet them at all? What consequences does this have for social interaction? And how is the cultural sector, for which the audience's physical presence is still essential, dealing with this?

Staythefuckhome was the name of a popular hashtag conceived at the beginning of the pandemic as a “self-isolation manifesto”. In the spring of 2020, staying at home had yet to be learned as a key measure for containing the virus. Yet spending time in the public space has by no means ceased entirely, although shops and precincts also had to close from a certain point onwards and strolling around them largely stopped. Under coronavirus conditions, probably more people overall are underway in parks and other green spaces than before. However, while at the beginning it was still quite common for people to meet up in larger groups at popular places such as Friedberger Platz in the Nordend suburb of Frankfurt, as measures tightened these small oases also disappeared. People are obliged to keep their distance from each other outside too; there are signs everywhere with warnings and bans. What, then, does the public space still offer and – above all – to whom?

Nowhere to chill out

For Antje Schlottmann, professor of human geography, the public space is a “space which is educational, but also appropriated in a wide variety of ways and in any case fought over”. However, the pandemic is not leading here to any general developments, she says, but to shifts that have to be considered in terms of space, time (of day) and social context: “There are too few park benches and playgrounds, also because these are now increasingly being used as gym equipment. On Frankfurt's main shopping street, the Zeil, there is more space again for needs that go beyond consumption, for teenage skateboarders in particular.” Above all young people are suffering from the ban on being allowed to meet outside in groups. Adults tend to overlook their need to “hang out” on park benches and in similar places – perhaps because it is not of general social relevance? This is the conclusion at which two educational scientists, Professor Sabine Andresen and Johanna Wilmes,

have arrived, who have examined, together with colleagues from the University of Hildesheim, how young people are dealing with the coronavirus pandemic. One important result from the study “Youth and the Coronavirus”: Above all, young people miss open spaces. “Chilling out is a way to escape from everyday life, reduce stress levels and exchange experiences with peers. In general, this first of all applies equally to most young people. However, during the lockdown it became a particular issue for those living in cramped conditions because it’s hard to stay in a small flat the whole time together with your family,” says Johanna Wilmes.

Masks trigger mistrust

The restrictions regarding meeting in groups and interacting with lots of people, whether friends, acquaintances or random people, might have consequences for the underlying mood in society. “You can put it in a nutshell quite simply: Trivial communication is missing,” says sociologist Professor Tilman Allert. “Gossip and chit-chat are what cements our social order together.” Because everyday conversation at the cheese counter, bus stop or on the park bench is

shape the social situation in a binding way, it is, however, an unreasonable demand under coronavirus conditions: “The uncovered face is an entry into communication; it’s a first greeting, even before we start speaking. The mask, by contrast, is a disguise with which we give mistrust a stage.” When facial expressions are missing, the look in our counterpart’s eyes becomes ambivalent, says Allert. And he even goes one step further: The coronavirus pandemic creates a certain mistrust; the mask becomes a symbol that our counterpart in the supermarket or on the bus could be a superspreader. “I’m pretty sure that this mistrust will disappear again once the pandemic is over because in principle no society can function permanently with mistrust in communication.” Even if Allert would sometimes like his fellow human beings to display a little more humility towards what cannot be changed, he assumes that normality will return: He is looking forward to lively social interaction, to the “return of nonchalance in our communication.”

The (in)ability to learn in Zoom conferences

The chit-chat at the cheese counter might be an unreasonable demand when “masked”. But how do things look in digital communication, which at least for many in the world of work and education has become the new normal? At least there, we can put our masks aside without having to forego communication with lots of other people. Christian Stegbauer, professor of sociology, has conducted a qualitative survey among his students on studying under coronavirus conditions. “They’re having a hard time,” he says, summarising the overall result. The university has lost its significance as a social space. Stegbauer is part of the network research community, which looks less at the individual person and their behaviour and rather at the “sociality in the space between”. He considers the concept of “cognitive social structure” to be elementary in explaining the special social situation in a seminar held via Zoom. “The question is: What do I know about the relationships of the people surrounding me so that I can then establish my own position? In the seminar room, I can see who is sitting next to whom, who is whispering to whom now and again or who is leaving the room together. In a Zoom conference, by contrast, I see each person in a tile without being able to gauge the connections among them.” Stegbauer also sees this as a loss of social learning and orientation: “In a seminar with personal attendance, you can quickly ask your neighbour how to write an essay; in a video chat, that possibility is practically eliminated because you don’t want to embarrass yourself by asking a ‘dumb’ question.”



Photo: Kzenon/shutterstock

“You can put it in a nutshell quite simply: Trivial communication is missing,” says microsociologist Tilman Allert – referring, for example, to chit-chat at the cheese counter.

missing or can only be conducted in “masked” form to a limited extent, people are increasingly focusing on politics and journalism. “This fuels the constant discussion about the crisis and the view that politics are failing miserably.” As a microsociologist, Allert is interested in everyday interpersonal situations, which have by no means disappeared even in times of the pandemic. He describes why, despite all efforts to



Photo: Petr Jilek/shutterstock

Chance encounters disappear

Casual friendships or acquaintances from university therefore currently play almost no role at all in students' social life, although these contacts would be important, since through them new students, for example, can access aspects of studying previously unknown to them. In contrast to these "weak" relationships, as network research would say, relationships to family members and just a few close friends, where you are sure that the risk of contagion is minimal, are the "strong" ones that currently dominate. These are, however, less helpful – at least as far as accessing the information required by students is concerned.

Research is equally focusing on what are referred to as "super-weak relationships". This is what connections between people are called who did not know each other beforehand and meet rather by chance, for example at large festivals, but also at concerts and in clubs. Such encounters were no longer possible from the beginning of the pandemic onwards, and at present it is not foreseeable when there will be such mass encounters again. "Because such large events are real hotspots for spreading the virus: Different spheres mix, certain everyday norms are partially set aside, for example under the influence of alcohol," says Stegbauer. That is why many a conservative observer is not at all in favour of such mass events, preferring instead to socialise in a small, manageable and "cultivated" setting. However, as Stegbauer points

out: "Close contact with people you wouldn't meet under other circumstances can be very enriching because here too you learn things that aren't otherwise on your radar."

Real and virtual audiences in the cultural sector

Sociologist Tilman Allert illustrates the loss of social interaction with a vivid image: "As a result of the coronavirus pandemic, we no longer have a stage at our disposal. Who wants to get dressed up?" But how do things look with the "real" stages? Theatre, opera, concerts, but also museums and cinemas thrive on an audience that experiences art together in close physical proximity. The economic losses caused by the pandemic are in any case enormous: In Europe, a downturn of 31.2 per cent is expected for 2020, in the performing arts even 90 per cent (SZ, 26.1.2021). Professor Nikolaus Müller-Schöll, theatre scholar at Goethe University, fears long-term damage especially for freelance artists, whom the lockdown is hitting particularly hard. As a rule, even very successful independent theatre groups are unable to build up reserves, he says. Despite all the state support, the lockdown is tearing a big hole. But even publicly funded theatres are also likely to suffer long-term damage, according to Müller-Schöll: "It will presumably take a long time before normal operations are possible again. This also means that people who were accustomed to going to the theatre regularly might not come back at all. And the situation is particularly threatening for the new

"Close contact with people you wouldn't meet under other circumstances can be very enriching," says network researcher Christian Stegbauer.

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Photo: Werner Leroy/shutterstock

“Chilling out is a way to escape from everyday life, reduce stress levels and exchange experiences with peers,” says educational scientist Johanna Wilmes. One place to chill out is at Brockhaus Fountain on the Zeil, Frankfurt’s main shopping street – a very popular spot before the pandemic, especially on hot summer days.

generation because it’s foreseeable that after the lockdown first of all those performances stock-piled during the pandemic will run, funding cuts will follow everywhere, and it will be much more difficult for new actors to get started.” In Müller-Schöll’s opinion, the artistic value of recordings available on the internet is still very limited: “What is not transposed into film or digital versions is the interaction between the actors and the audience.” But how might such a transposition look? “On *Nachtkritik.de*, recordings of *Theatertreffen* performances and selected classics were accompanied by a live chat, where people could discuss what they were watching. This fulfils, to some degree, the wish expressed by Brecht: That the audience in the theatre should be like that in the football stadium, where everyone is an expert – and everyone knows better than the man on the coach’s bench what ought to happen next.” In 2020, students of theatre, film and media studies created a digital festival where you were sent a box beforehand containing all kinds of utensils, which then had to be opened and used in the course of the pre-produced “viewings”, from bars of chocolate to lipstick (<https://www.vvipfestival.com>). Müller-Schöll draws a cautiously optimistic conclusion: “We find ourselves here at the transition to another, in many dimensions so far scarcely developed medium. And after the lockdown new forms will evolve out of experiences gathered during this time which will certainly stay with us.”

One of the topics explored by his colleague Vinzenz Hediger, professor of film studies at Goethe University, is the development of cinema culture in the age of digitalisation. In Hediger’s view, the coronavirus pandemic could accelerate the success story of streaming services. Netflix & Co are convenient alternatives because cinemas are closed – but also for want of other things to do in the evening. And they are already more popular among young people



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IN A NUTSHELL

- The pandemic has greatly changed the public space. To avoid infection, keeping a distance and wearing masks are the order of the day.
- The loss of open spaces is especially hard to bear for young people: They lack important opportunities to escape from everyday life. This particularly affects young people from less affluent backgrounds.
- The mask also changes human coexistence: It conceals facial expressions, the look in our counterpart’s eyes becomes ambivalent, mistrust sets in.
- With the shifting of learning situations into virtual space, communication among learners is curtailed, social learning and orientation are lost.
- “Super-weak relationships” – for example contacts between strangers at a festival – are also lost because this kind of event is no longer possible under pandemic conditions. The entire culture and entertainment industry hangs on this because shifting events to an online format is only possible to a very limited degree.

than regular TV. Is the coronavirus pandemic the nail in the coffin for cinema culture? “Cinemas will presumably prove to be more resilient than it would appear at the moment. You could write a whole history of cinema consisting solely of premature eulogies,” says Hediger, who nonetheless sees cinema culture in danger. That is why he would like to see a debate on more support for arthouse and rural cinemas modelled on film funding in France. ●



Photo: Katja He

Between work and getting supper: Working from home and home schooling have meant additional challenges for parents in everyday life.

The family system: little room for manoeuvre

Sabine Andresen on the particular burdens on families during the pandemic

Ms Andresen, you're a child and youth researcher. I would, however, first of all like to discuss another age group with you – the "middle-aged". How are above all mothers and fathers getting through the pandemic?

In the spring of 2020, we conducted our first "KiCo" study ("Children, Parents and their Experiences during the Coronavirus Pandemic", see box) just as the lockdown was being very carefully eased.

25,000 people, mostly middle-aged mothers and fathers, answered the online questionnaire within a very short time and set aside a lot of time to do so because, among others, they had to answer questions for each individual child. That alone was an impressive signal: There is a tremendous need to be heard and seen, especially among adults with responsibility for children and adolescents. Parents who have to organise and manage so many things at the

moment are evidently asking themselves: Who is actually thinking about us? We must, however, restrict this statement and say that this large group is by no means representative of all parents in Germany because we mainly reached well-educated working women and men.

What particularly concerns this age group at such a busy time in their lives?

There is no one answer to that question. At present, it seems to be the case that parents feel unsettled because they're worried that they will hardly be protected against an infection if they aren't vaccinated. After all, they weren't in one of the priority groups initially. The surveys available, including international ones, also reveal that mothers with children of an age where they require a lot of time and attention, i.e. nursery school children, are particularly stressed if they have to manage their

ABOUT SABINE ANDRESEN



Professor Sabine Andresen, born in 1966, is professor of educational sciences at Goethe University, with a focus on social education. She studied German, history and music in the framework of a teaching degree as well as education. In 1997, she earned her doctoral degree in educational sciences at the University of Heidelberg and in 2003 her post-doctoral degree (Habilitation) at the University of Zurich on the topic “Socialist Concepts of Childhood. Political Influences on Education”. Sabine Andresen held her first professorship at the University of Bielefeld before moving to Goethe University in the summer semester of 2011 – initially to a research professorship in family

studies. Sabine Andresen is a member of the scientific advisory board of the Institute for Interdisciplinary Research on Conflict and Violence and a member of the Academy of Sciences and Literature. She has been chairperson of the Independent Inquiry into Sexual Child Abuse in Germany since 2016. She is currently examining the situation of young people during the coronavirus pandemic within a joint project with the University of Hildesheim. The basic conclusion of the two studies JuCo I and II: Children and adolescents are severely affected by the crisis and should be involved and heard more.

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jobs alongside caring for and raising children during the pandemic. Those working from home are faced with the task of how to manage their work and have shifted their working hours to the early morning and late evening. Those who cannot work from home agonise over the question: How is my child doing in emergency daycare? In the first lockdown, for example, no lunch was provided. In addition, it's precisely people in such occupations who cannot work from home that often have a low income.

But isn't this group always particularly affected? Doesn't the pandemic simply act like a magnifying glass here?

We know from family research that the entire family system with the tasks that the family has – above all when young children are involved, and even more so when it comes to caring for older relatives – has little room for manoeuvre. Various studies show this, such as those by family sociologist Karin Jurczyk of the German Youth Institute on the blurred boundaries between gainful employment and family work and the associated stresses and strains, and on feeling inadequate on all fronts. I can remember one mother saying in an interview: “When nothing fits together anymore.” Mothers and fathers report that they feel like they're chasing their own tails trying to reconcile everything. They have to juggle a lot of balls in this

phase of their lives and accomplish an enormous amount. But we need to look very closely at socially conditioned differences. The stress of facilitating as many leisure activities as possible for your child alongside your job and helping with their schooling tends rather to be a lifestyle and parenting style of the middle classes. Families in precarious socio-economic circumstances face completely different issues. In such cases, parents are busy explaining to their children why they can't have things and about going without as well as being confronted at school with expectations of “parental involvement”, meaning that they soon reach their limits there too as far as time and other issues are concerned. This means that this phase is characterised overall by a lot of real effort. Although we've been talking about shared responsibility for child-raising and caring for the elderly for at least 20 years, this still depends very much on family commitment. I'm not so sure – coming back to the magnifying glass – whether the burdens on families during the pandemic have lastingly raised the awareness of those responsible for family, labour and social policy.

How does the particular and permanent stress during the pandemic impact on the family situation?

That depends on a family's respective resources. How high is the income, how

many mouths does it have to feed, what are working conditions like, are there any health issues. In everyday life, it quickly became clear that living conditions are important: How much space is available for people to live together and get along? Everything that previously took place in different locations now comes together at home. Individual family members often have nowhere to withdraw to. For their well-being, adolescents need a place where they can learn in peace, but also as a retreat, that is, their own private space. But mothers and fathers need this too. However, if living space is limited, they let their own needs come second. The neighbourhood and surroundings also play an important role: Is there a park, a garden? And a third factor is future prospects: Are there job worries? Is the family affected by short-time work, by unemployment? These are, of course, considerable stress factors. A study from the USA shows that job loss can be an indicator for the potential for violence in families to increase – both regarding violence towards the partner as well as towards children. And as yet we know far too little about this and are still far too insufficiently prepared for it. It will be necessary to provide some good support here.

At the beginning, it was said that violence within the family had not increased during the pandemic. Do you have a different inside view?

At the beginning, the number of reports even decreased, for example reports of child welfare being at risk. However, this was due to the fact that school teachers and nursery staff were not there to report cases. It is much harder for a child to call a helpline when everyone is at home. Nonetheless, it was important that helplines were opened for longer, for example “Nummer gegen Kummer”. In addition, a lot of children were not taken to the doctor over a long period of time, so that this group too was unable to help a child if violence was suspected. Data have recently been published which show that the “Gewalt gegen Frauen” helpline for women threatened by violence has seen a significant increase in counselling. There is clearly an urgent need for research on this.

Some parents are aware of the danger that they might use violence. How could they be helped in good time before something happens?

The approach in Germany, which is also anchored in the Federal Child Protection Act, is to help parents and empower them to bring up their children without violence. It's about offering support so that such situations do not arise in the first place. Child protection and empowering parents to bring up their children without violence are reliant on local networks. Frankfurt has such a strong network. Child protection and protection against violence require a very good infrastructure during a pandemic too.

Are there also families that will emerge from the pandemic stronger than before?

In our KiCo survey in the first lockdown – we really need a new one now – there were two types that contrasted with each other. On the one hand, there were the mothers at the end of their tether, exhausted and in despair, with major worries and fears for the future, also concerning what their children will miss out on. And on the other hand, we had lots of parents who were happy that so many things were off the agenda; this constant stress of optimising all family members' lives, for example through various leisure activities. But I would venture the hypothesis that this group has meanwhile shrunk considerably because it has all already been going on

for so long and the psychosocial consequences are now coming to the fore so much more clearly. The emotional strain, lack of exercise, children's health problems. After all, mothers and fathers are the first to notice. In this respect, I think that has changed again a lot now.

Would you agree with the Federal President when he said that the COVID generation will develop very special future skills?

Yes, I would. But we would have to ask the adolescents and young adults themselves what they've learned, what positive things they've extracted for themselves. Talking now about the crisis as an opportunity, also as a formative element, is something I can understand as far as politics is concerned. The purpose of that is also to foster hope and draw attention to the fact that young people and students are not just learners at

experience different types of support, creativity without cutting costs, and the well-being of the young generation is prioritised. Young people have shouldered a lot, and they've done so with great readiness and solidarity. But existing studies show that they're worried about their own and society's future. I have the impression that they've so far not been given good answers to the questions related to this – which also include topics such as climate protection and social justice or democracy.

We've talked a lot now about families. In your opinion, where else do we need to take a closer look?

An area that preoccupied me a lot especially around Christmas, when it became particularly apparent how suddenly everyone was reduced to relationships in the family nucleus, completely ignoring the fact that many people do not



Photo: Kzenoni/shutterstock




Photo: Melinda Nagy/shutterstock

Stress test: How are you supposed to concentrate on a phone call when family life is going on in the background? And especially younger children need encouragement and support when learning at home.

their place of education but also learn a lot in other places and in other circumstances – that is an important message. But this will presumably only be an opportunity if children and adolescents

want to celebrate Christmas with their family of origin for good reasons. The regulations regarding whom you were allowed to meet were based on a very traditional image of the family, which does not correlate at all with many people's lives. I ask myself why it is that friendships or an elective affinity are treated in a subordinate way. Family research should take a closer look at this.

The interview was conducted by Anke Sauter.



National table tennis player
Juliane Wolf has now
also overcome long COVID.

Photo: Binh Truong/DBS

The heart after COVID-19

Not all long-term damage disappears without treatment

By Anne Hardy

Even young and healthy individuals can still suffer myocardial inflammation weeks after recovering from a COVID-19 infection. Pioneering work in Frankfurt using high-resolution magnetic resonance imaging has now corroborated this. Frankfurt scientists are currently heading research work into the reasons behind it as well as the therapies which could protect and heal the heart.

Top athlete Juliane Wolf, national table tennis player and fourth in the world rankings in para table tennis, was in fact very lucky. Although she contracted SARS-CoV-2 in November 2020, she had hardly any symptoms – a mild course of the disease, as is frequently the case among young people. However, she remained very tired and developed a headache if she looked at a monitor for a long time. It was at University Hospital Frankfurt that she was diagnosed with something she had not expected: myocarditis. The 33-year-old was shocked. “At that time, I was just about to start my proper training again, but instead everything ground to a halt. That was particularly hard to get my head round in the run-up to Tokyo,” she explains. Wolf is not only an athlete but also works as a research associate at the Faculty of Educational Sciences. No drugs have yet been tested for this mild form of myocardial inflammation. Instead, she was urged to avoid stress.

Heart damage like in chronic diabetes

Julia Wolf’s medical examination was part of a study by Professor Eike Nagel, Dr Valentina Puntmann and their team at the Institute for Experimental and Translational Cardiovascular Imaging at University Hospital Frankfurt. In the framework of this study, the physicians are looking at the long-term effects of a COVID-19 infection on the heart.

In most COVID-19 patients, only severe courses of heart muscle inflammation, that is, myocarditis, have so far come to attention. “As far as mild cases are concerned, we’re seeing a

grey zone that we think is underestimated, although we don’t yet have any exact figures based on epidemiological studies,” says Professor Nagel. His group specialises in detecting myocarditis at an early stage. The researchers have developed their own magnetic resonance imaging (MRI) methods that are more accurate and less error-prone than the standard programmes offered by the equipment manufacturers. To date, these methods are not used routinely.

Together with his colleague Dr Valentina Puntmann back in July 2020, Nagel was one of the first researchers worldwide to look at long-term heart damage following a COVID-19 infection. The results of the study, which appeared in the scientific journal *JAMA Cardiology*, caused a sensation: In 78 per cent of the test persons, changes in the heart were detectable two months after the onset of the infection. 60 per cent suffered from inflammation of the heart muscle cells.

“This doesn’t mean that 78 per cent of the participants in the study will develop a heart problem as a result of COVID, since changes in the heart muscle were also seen in a control group without COVID that has the same risk factors, such as smoking,” Nagel stresses. What stands out, however, is that in the post-COVID group the changes are far greater. “More than half the patients show signs of damage that is more pronounced than in people with chronic diabetes or high blood pressure.”

Cardiac insufficiency will increase after COVID

The second important finding was that 22 per cent of the participants in the study displayed increased amounts of water in the heart muscle, which indicates slight to moderate inflammation. Seen from a purely statistical perspective, these patients have an increased risk of developing cardiac insufficiency or arrhythmias in the course of their life. That is why Nagel considers it important to recognise these early stages. Without declaring people sick because of it. “My aim is to keep people as healthy as possible,” he says.

What is thought-provoking is the fact that myocardial inflammation also occurred in people

LONG-TERM HEART DAMAGE FROM COVID

In principle, three types of long-term damage can occur: As a result of the infection, plaque can break off and clog coronary vessels, causing a heart attack. There is also an increased risk of this with influenza. Or patients suffer microinfarcts, which in general cannot be detected with standard imaging methods because only small regions are affected. This seems to occur frequently in COVID-19 infections and makes the heart less resilient. The third possibility is diffuse myocarditis, which can be triggered by immune cells fighting the virus or from autoimmune reactions. This also causes heart muscle cells to die and tissue to scar.

who had only experienced a mild bout of COVID, like national table tennis player Juliane Wolf. Most of the test persons suffered from non-specific symptoms such as shortness of breath and fatigue.

Nagel advises caution: “People always say: You’ll be alright. With young people who are fit that’s indeed the case. But they still display measurable damage nonetheless. Perhaps their performance is only 98 per cent. Top athletes notice this quickly. But they’re trained to give it their best at all times and try to compensate for this through harder training. That’s not necessarily the best thing to do if you still have some slight inflammation.”

Myocardial inflammation often goes undetected

When would Eike Nagel recommend an MRI scan? When a patient complains of palpitations, does not feel particularly fit and his or her troponin levels are slightly increased. Troponin-T is a protein that performs an important function in the contraction of the heart muscle cells. If these are damaged or die off, more troponin-T is released into the blood. “The level doesn’t have to be as high in early myocarditis as in a heart attack because in early myocarditis some of the cells are only damaged and the damaged cells release less troponin than the dying ones. On the basis of the data available so far, we can’t yet say what the threshold is.”

The MRI scan then makes it possible to identify areas where scar tissue has formed because heart muscle cells have died off (T1 value). Unlike after a heart attack, the scarred (fibrotic) tissue is distributed diffusely in the heart muscle. In addition, the accumulation of fluid in the heart muscle (T2 value) can be seen, which indicates inflammation. In an acute case, such as that of athlete Juliane Wolf, the heart can recover again as soon as the water disappears out of the tissue. Some cells, however, do not recover, as can be deduced from the T1 value once the inflammation has gone. If it is still high, the damage is irreversible.

Studies in the planning for the treatment of long-term damage

No drugs for this early form of myocarditis have yet been approved. That is why Nagel is planning a multicentre study with partners at the German Centre for Cardiovascular Research. If microinfarcts are presumed to be the cause, vasodilative strategies might be the answer. Low-dose ACE inhibitors (in higher doses they lower blood pressure) could be used to counter the formation of scar tissue. Researchers such as Professor Stefanie Dimmeler, director of the Institute of Cardiovascular Regeneration, are currently pinning a lot of hope on anti-inflammatory therapy, for instance with cortisone: “Cortisone attacks inflammation on a broad

ABOUT STEFANIE DIMMELER AND EIKE NAGEL



Professor Stefanie Dimmeler, born in 1967, studied biology and earned her doctoral degree at the University of Konstanz. After three years at the University of Cologne, she joined the Department of Cardiology at Medical Clinic III of University Hospital Frankfurt and Goethe University, where she has headed the “Molecular Cardiology Working Group” since 1997 and earned her post-doctoral degree (Habilitation) in 1998. Stefanie Dimmeler has been professor of molecular cardiology at Goethe University since 2001 and director of the Institute of Cardiovascular Regeneration at the Centre for Molecular Medicine since 2008. She is spokesperson of the managing board of the German Centre for Cardiovascular Research e.V. and of the Cardio-Pulmonary Institute cluster of excellence.

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Professor Eike Nagel, born in 1967, studied medicine at the University of Cologne and earned his doctoral degree there on the topic of magnetic resonance imaging. He trained as a cardiologist and specialist in internal medicine in Kiel, Zurich and at the German Heart Center Berlin. Having completed his post-doctoral degree (Habilitation), he was professor and head of the Department of Cardiovascular Imaging at King’s College London from 2007 to 2015. Since 2015, he has headed the Institute for Experimental and Translational Cardiovascular Imaging at University Hospital Frankfurt and holds a professorship of the German Centre for Cardiovascular Research at Goethe University. Eike Nagel is one of the founding members of the Society for Cardiovascular Magnetic Resonance (SCMR).

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scale and in so doing also protects the heart and the blood vessels,” she says.

The institute is also currently testing various cardiac drugs to see what protective effect they have on the heart. In addition, studies are being conducted on how to prevent thromboses in order, in turn, to prevent infarcts.

How does the virus enter the heart?

Biologist Professor Stefanie Dimmeler has been studying the effects of SARS-CoV-2 on the heart at cell and tissue level since the beginning of the pandemic. Back in February 2020, she was already working with Professor Sandra Ciesek, head of virology at University Hospital Frankfurt, who had isolated the virus from people returning from Wuhan. First, Dimmeler infected heart muscle cells and endothelial cells, with which the walls of the blood vessel are lined, in cell cultures. The next step was to examine infected 3-D heart cultures. Such tissue-like cultures beat or twitch in the test tube like little hearts. As Dimmeler observed: “The beat rate rises steeply when cultures are infected, indicating that the cells are under severe stress. They die off within three days.”

The next step was to examine tissue sections from human hearts obtained during organ transplantations. For this, Stefanie Dimmeler travelled during the first lockdown – with special permission from the Chancellor – to the Medical

HOW THE VIRUS ATTACKS HEART CELLS

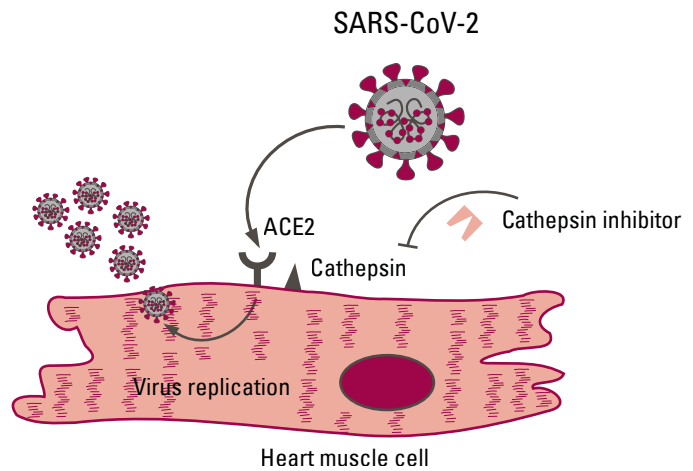


Diagram: Julian Wagner; adapted by Peter Kiefer

Centre of LMU Munich. There, she placed thin slices of heart tissue immediately after removal into the incubator she had brought with her and in which electrical impulses stimulated the tissue slices to continue contracting. “It was very exciting,” she remembers, “because we didn’t know whether the heart tissue would survive transportation back to our lab undamaged.”

In order to penetrate heart cells, SARS-CoV-2 needs the ACE-2 receptor as well as the cellular molecule cathepsin. In the laboratory, cathepsin inhibitors were able to stop the virus from multiplying in heart muscle cells.



Photo: Uwe Dettmar

MRI images for research: Cardiologist Dr Valentina Puntmann looks after a study participant at the Institute for Experimental and Cardiovascular Imaging at University Hospital Frankfurt.

Further information

<https://www.cardiac-imaging.org/in-the-media>

One important finding from these experiments: Heart muscle cells are infected via a slightly different route than lung cells. Heart muscle cells have only small amounts of the protease TMPRSS2, via which the coronavirus enters lung cells. Instead, the virus uses the protein cathepsin, which is found in large quantities in the heart. In the laboratory trials, cathepsin-inhibiting agents were able to stop the virus from replicating. These agents could be used in future in the acute stage of a COVID-19 infection – to date no inhibitors have been approved.

Damaged hearts and blood vessels are more vulnerable

“With COVID-19 infections, we have the chicken-and-egg dilemma, meaning we don’t know whether the heart problems can be traced back directly to the attack by the virus or whether they’re the result of immune-related inflammatory reactions that also damage the endothelium,” explains Dimmeler. In a healthy person, the endothelium, which lines the walls of the blood vessels, prevents viruses from entering the heart muscle via the blood. The coronavirus is not able to overcome this vascular barrier either, as Dimmeler’s team was able to prove through experiments on five different types of endothelium: “Although the endothelial cells in the heart can absorb the virus, it doesn’t survive in them. This means that the endothelium is a protective shield for the heart.” However, people with vascular diseases or pre-damaged hearts are at risk, since in their case the virus can take a firm hold in the heart.

And why then can myocarditis occur as a long-term effect in people whose heart was previously healthy? Stefanie Dimmeler suspects that the endothelium is attacked by immune reactions and that this destroys its barrier function.

Dimmeler and her team also used cell cultures to study the effect of remdesivir, the virostatic agent that has been the first approved treatment for COVID-19 in the United States since November 2020. They showed that remdesivir stops the virus from replicating in cells – irrespective of whether it is a lung or heart muscle cell. However, clinical trials with the drug have so far not been particularly convincing. Dimmeler assumes that the virostatic agent is only effective if administered at an early stage of an infection. “Once the virus has attacked the organs, it’s probably too late,” she says.

What can be done in the acute phase?

Whether the heart is damaged during an acute COVID infection and administering a drug such as remdesivir or cathepsin inhibitors is promising could be decided with the help of high-reso-

IN A NUTSHELL

- COVID infections have long-term effects on the heart, which could often lead to cardiac insufficiency later on.
- High-resolution MRI can be used to detect myocardial inflammation at an early stage.
- Pre-damaged hearts and blood vessels as well as autoimmune inflammatory reactions as a result of a COVID-19 infection increase the risk of myocardial inflammation.
- If cardiac function is impaired or pathological biomarkers such as troponin-T increase, extreme physical exertion should be avoided.

lution MRI. However, it is not possible simply to wheel COVID patients from the hermetically sealed wing of an intensive care unit through the hospital to an MRI machine, especially if they are on a ventilator. This would require changing hospital infrastructure and making an MRI scanner available exclusively for COVID patients. “It takes two hours after the procedure before the machine is aerosol-free again,” explains Eike Nagel. This is extremely laborious both for routine hospital operations as well as for research.

National table tennis player Juliane Wolf’s heart has meanwhile recovered without therapy. During a second MRI scan in mid-March, it looked healthy again. “I only started training again slowly after the long break nonetheless,” she says. ●



The author

Dr Anne Hardy, born in 1965, studied physics and earned her doctoral degree in history of science. As a freelance science journalist, she specialises in natural science and medical topics.
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Photo: © trigon-film.org

The conspicuous absence of crowds

Escape or confrontation?

How the pandemic has influenced the way we watch movies

By Isadora Campregher Paiva

How is the cinema audience reacting to the ongoing infection risk? Do people seek to temporarily escape reality by immersing themselves in tales of fantasy and romance? Film scholar Isadora Campregher Paiva has made some surprising observations.

When the COVID-19 outbreak first reached pandemic status, a curious phenomenon happened. Rather than searching for escapist entertainment to distract from the horrifying situation, many people sought films that dealt with the same problems we were going through in real life. *Contagion* (Soderbergh, 2011), a relatively realistic film

about the global spread of a deadly virus, was the most popular representative of this genre. Though it was a moderate success when it came out, the film had mostly been forgotten by 2020, unavailable in most streaming platforms. But as the coronavirus started to spread, so did *Contagion*'s popularity: the Google searches for the film exploded in March 2020, far surpassing the numbers for when it first came out.

This drive to watch a film that hit so close to home was certainly not the tendency for everyone. When asked about the renewed popularity of *Contagion*, one of the film's stars, Kate Winslet, said "I just felt so freaked out, why would anyone watch *Contagion*? It's about a horrible pandemic in which many people die!" (Winslet,

The pink cloud: symbol of anti-feminism, the destruction of nature – or of the pandemic? With her work shot in 2019 and released in 2020, Brazilian director Iuli Gerbase has experienced how differently films are perceived depending on the temporal context.

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2021). What explains this drive by some to see their ongoing trauma reflected on the screen? Several authors have posited that one purpose of fiction is to allow us a space to vicariously live through intense emotions and states without exposing ourselves to the complexities and risks of actually going through them (Kaes, 2009). This can be anything from the experience of danger to one's life in a horror film to the thrill of new love in a romance.

The comfort of narrative logic

But what is the point of practising what is already being experienced in the real world? Watching a pandemic film during a pandemic, particularly one as realistic as *Contagion*, bounds and orders the experience in a narrative frame

IN A NUTSHELL

- Instead of avoiding the unpleasant reality of the pandemic by watching escapist films, many people watched ones about epidemics and catastrophes at the beginning of the coronavirus crisis – such as the 2011 Hollywood film "Contagion", which was only mildly successful when first released.
- The reason for this behaviour could be that watching fictional stories serves as a kind of emotional vaccine, which prepares us for the real version. In addition, films follow a narrative logic that is comforting in contrast to real life.
- The pandemic permeates our thinking, so that all movies are seen through a new lens. While some normal social scenes might become hard to watch, dystopic scenes might suddenly seem comforting.
- The reinterpretation can go so far that some films might be said to have "predicted the coronavirus". While this can enrich a viewing experience, it can also erase the original meanings embedded in the film, as in the case of "The Pink Cloud".
- The aftermath of the Spanish flu might give us an idea of the cultural footprint COVID-19 will leave. Its traces will likely be found not only in direct or metaphoric references to the disease, but also in conspicuous absences.

that has a beginning, middle and – most importantly – an end. This was particularly important at the start of the pandemic, precisely the moment in which *Contagion's* popularity exploded, since people wanted to feel emotionally prepared for what was to come. This works as a form of emotional vaccination: By exposing ourselves to the thing we fear in a safe format, we prepare for the real version. There is a measure of escapism to a story about horrific events, since no matter how terrible, it still follows a narrative logic that is absent from real life, where disease is often random and devoid of meaning.

This obsession with pandemic narratives seems to have waned after the initial outbreak, giving way to a different type of relationship to films. As the months of confinement dragged on, the pandemic became such an all-encompassing part of our lives that, even if we tried, it was impossible to escape it. Watching characters engage in the kinds of behaviours we have been taught to avoid (coughing on their hands, gathering in groups, sharing drinks, etc.) became anxiety-inducing for many. The corollary was also true: Scenes that used to be associated with dystopic narratives, such as empty cities or people wearing masks, suddenly seemed comforting. This uncanny inversion of our usual signifiers, making ostensibly peaceful scenes tense and vice versa, is recognisable to the viewer as a misreading of a film's intentions. Nevertheless, it is hard to ignore, leading to an inability to immerse oneself in the fictional world of the story.

New insight into old films

But the projection of our everyday anxieties onto films unrelated to the pandemic need not be a demerit. In some cases, it can add a new layer of meaning and relatability that enriches the experience of watching a film. In the discussions I have had in film studies classes in the last year, students routinely saw unnerving parallels to the pandemic in all types of films, no matter how old. When, for instance, the mayor of a seaside town refuses to hurt the local economy to save the lives of beachgoers in *Jaws* (Spielberg, 1975), his behaviour was identified as eerily reminiscent of the response of several political figures during the coronavirus. While his refusal to follow the advice of specialists who warn of the imminent danger of a shark attack might have previously appeared cartoonishly misguided, it now seemed perfectly believable – and all the more terrifying for it. The parallels seem so obvious that, had *Jaws* been released in 2021, it would likely have been interpreted as an allegory for the coronavirus.

A film that was released this year has proven an interesting test case for this. Iuli Gerbase's

The Pink Cloud is a sci-fi drama in which a deadly cloud mysteriously appears around the world, forcing everyone into a lockdown that stretches on for years. The film focuses on a couple who had just had a one-night stand and find themselves compelled to foster a domestic relationship to cope with this strict confinement. Although it was written in 2017 and shot in 2019, the film's premiere in 2021 has made it necessary to add disclaimers both in the trailer and at the beginning of the film stating that "any resemblance to actual events is purely coincidental". Understandably, there is not a single review of the film that fails to mention the uncanny way it reflects our current situation. What is particularly fitting is that the film touches upon something that is rarely reflected in other stories about fictional disasters: the absolute boredom of it and humans' ability to adapt to even the most bizarre circumstances. With none of the extreme cinematic violence of other allegories for real-life pandemics (such as modern zombie films in the style of *28 Days Later* or *Train to Busan*), *The Pink Cloud* hits particularly close to home.

Meaning gained and meaning lost

Both *Contagion* and *The Pink Cloud* have been said to have "predicted" the coronavirus pandemic, in a tone that borders on the mystical. What is left on the wayside by this language is the fact that these films – like all works of art – were extrapolating from issues that existed in the period in which they were made. While our experience of these films is in some ways enriched by our current situation, there is also a loss of the meaning that had been embedded in the work at the time it was made. In the case of *Contagion*, not only were previous epidemics such as SARS and H1N1 sources of inspiration, but the film was primarily based on the research of scientists who carefully delineated what could happen in a pandemic. The fact that the film's virus first develops in China and is originally transmitted by a bat is not freakishly prophetic, but grounded in scientific knowledge of risk areas available at the time the film was made.

Because of its release during the COVID-19 pandemic, the media discourse surrounding *The*

Pink Cloud has been even more mystical. In reviews, writer and director Iuli Gerbase is repeatedly called "a prophet" and "a clairvoyant". On the review aggregator website *Rotten Tomatoes*, the critics consensus reads "An eerily relevant debut from writer-director Iuli Gerbase, *The Pink Cloud* reaches into the emotional fault lines of *pandemic* life and comes away with striking observations about human behavior." (*The Pink Cloud* (2021), 2021, emphasis added). It is telling that the word used here is pandemic, rather than quarantine, which would be more accu-



Photo: ulistern bild - United Archives / PictureLux / T

rate. The toxic cloud in the film has little in common with the coronavirus, apart from the fact that it is a worldwide phenomenon which forces people to stay inside their homes.

The Pink Cloud – pandemic wins out over feminism

Asked about the effects of this coincidental synergy, Gerbase notes that she was immediately scared it would limit the possible readings of the film:

"When I wrote the script, I had imagined many possible meanings for the pink cloud. For me, the most obvious and present one is the aspect of feminine repression and forced monogamy. [The protagonist] is forced into a model of

Seems somehow familiar: The US film "Contagion" from 2011 seems to have predicted many aspects of the coronavirus pandemic, e.g. looted supermarket shelves. In 2020, the film, originally only moderately successful, experienced an impressive renaissance.



Photo: picture alliance/PictureLux/The Hollywood Archive | The Legacy Collection

Old films seen in a new light: Mayor Vaughn (left, Murray Hamilton) in "Jaws" refuses to restrict tourism to protect bathers. From today's perspective, misguided but not unrealistic behaviour.

womanhood that society expects her to follow and that's also where the pink color of the cloud comes in. But there were lots of other possible interpretations, of it being some kind of punishment or revolt from nature, or even that it could be a metaphor for urban violence and how we end up locked inside our homes. With the pandemic, the first thing I thought was 'my God, people are going to see the movie and it will be *'The COVID Cloud'*' (Gerbase, personal interview, 9 March 2021).

Indeed, only a handful of reviews note the allegorical reading of the cloud as an embodiment of traditional femininity, which would likely have been the dominant one had the film been released a year earlier. The female protagonist of *The Pink Cloud*, initially a fiercely independent woman resistant to having kids, is compelled by circumstance into a monogamous heterosexual relationship and motherhood. Through the use of filters, the deceptively beautiful light of the cloud permeates every shot, bathing the film in rose-tinted irony.

Gerbase also sees a silver lining in the timing of the film's release, pointing out that people relate to the characters on a much more visceral level than she could have expected. The extra

attention that the coincidence brought has also likely helped the film to be accepted into the prestigious Sundance Film Festival, where it premiered. Still, Gerbase notes that *The Pink Cloud's* topical nature can make distributors cautious to buy the film at this stage, afraid that, after a year of seclusion, people are looking for more escapist fare.

Spanish flu as blueprint

Distributors have good reasons to be wary, as it is hard to predict what audiences will be drawn to in the future. The experience of the 1918–1919 influenza pandemic might give us an idea of the effects COVID-19 will have on the types of films that are made. Dubbed "the forgotten pandemic" by historian Albert Crosby (2003), the so-called "Spanish flu" left an allegedly scant cultural footprint in the art and entertainment of the decades that followed it. Recent scholarly works have revised this narrative, however, pointing out that the effects of this deadly pandemic are to be found in a wide variety of cultural works, though typically in oblique or metaphorical form (Outka, 2020). Once one knows what to look for, the footprints of the pandemic can be seen in many forms, from the influenza-



The author

Isadora Campregher Paivak (28) is a teacher and film researcher at Goethe University Frankfurt. She has followed up her MA in Sociology from UFRGS (Brazil) with the International Master in Audiovisual and Cinema Studies (IMACS) based at Goethe University, with exchange semesters at the University of Liège (Belgium) and University of Amsterdam (Netherlands). She is currently a research associate in the project Digital Cinema-Hub, which focuses on developing and applying digital methods to the study of film. Her own research focuses on the changes in the American film industry in the age of streaming.

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weakened heart of Mrs Dalloway in Virginia Woolf's eponymous novella (1925) to the plague spread by the vampire in the German film *Nosferatu* (Murnau, 1922). The cultural legacy of COVID-19 will likely be similarly layered, to be found not only in direct or even metaphoric references to the disease, but also in the conspicuous absence of crowd scenes and shared straws. The one thing we can all be certain of is that the meaning we ascribe to films is affected by the circumstances in which we watch them and will therefore change over time. It will be up to future film scholars and historians to parse out – and routinely re-assess – the pandemic's long-term cinematic effects. ●

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Plague and excess

A deadly plague in ancient Athens left its mark
on Europe's cultural memory

By Hartmut Leppin

During the outbreak of the Peloponnesian war, a mysterious plague raged through the proud city of Athens, weakening its position against the Spartans. Although it is not clear today which pathogen caused the epidemic, the Athenian historian Thucydides wrote a vivid account of its effects on society, describing uncertainty, lawlessness and a tendency towards excess.

Athens was a magnificent city in 500 BC. The Athenians had defeated the mighty Persian Empire, not without the help of their allies, but in a leading position. Athens was emerging as the dominant power in the Aegean, continuing to stand up to Persia and bringing formerly allied Greek cities under its control. It flexed its naval power with a strong and capable fleet, ensuring dominance of the seas. Culturally, Athens experienced a splendour during classical antiquity that shines to the present day. The tragedies of Aeschylus, Sophocles and Euripides and the comedies of Aristophanes are still performed today; Herodotus recited the first work of history there and magnificent buildings and works of art were created, for example on the Acropolis. Athenians had been seized by a sudden awareness of their skills (Könnensbewusstsein: Meier, 1980). Their contemporaries were fascinated and fearful of the city's gathering momentum. But the Spartans, who were known for their military discipline and mocked for their cultural backwardness, remained fierce rivals. In 431 BC, war broke out between the two powers. Many other Greek cities joined the war, as did armies from Macedonia and Persia. The war ended with the fall of Athens in 404 BC.

¹ The following quotes in italics are adapted from the translation by C.F. Smith, Cambridge/Mass. 1919.

An account of war and plague

Today, we speak of the Peloponnesian War. The fact that we consider various phases of war and peace during this period as part of a single historical narrative can be traced to the historian Thucydides, whose work was named after this war.¹ The renowned Frankfurt ancient historian Hermann Strasburger called him the founder of political history because unlike Herodotus he wrote mainly about politics and war, and rarely about anything else (1954, 395-428). However, Thucydides also gives a detailed account of a plague that tormented the city of Athens in 430 BC.

It began to spread in the port of Piraeus and then throughout the city, which was overcrowded because of the war. Men, women and children were taken unexpectedly and severely ill. Symptoms travelled from the head downwards; foul breath, coughing and sneezing were a sign of infection and the disease caused vomiting, rashes, ulcers, fever and an unquenchable thirst. Most of the infected died by the seventh or ninth day. Unlucky victims experienced prolonged agony; some lost parts of their limbs, genitalia, eyesight, or memory. Thucydides, himself a survivor, describes the course of the disease in the language of medicine of the time. It is estimated that a quarter of the population died, later sources state that Pericles, the political leader of Athens, perished among them.

Many modern physicians have attempted to determine the disease which caused the plague of Athens. References have been made to measles, Ebola, the Marburg virus or Borrelia. Perhaps research will gain clarity if bones from victims of the epidemic with sufficiently well-preserved DNA to determine the disease can be found. Investigations that are still currently disputed point to typhoid fever.

Splendour and catastrophe

Beyond documenting the terrible consequences of the plague, Thucydides delivers a parable of the transience of a political order and the limits of human agency. He artfully prepares the scene of the catastrophe by evoking the splendour of Athens: Pericles delivers a speech to the Athenian casualties of the first year of the war in 431, in which he celebrates not only the fallen but also the city itself (2:35-46). Such elements of ancient historiography did not follow a protocol of the original speech and were often embellished by the historian. Thucydides chose his words consciously. Pericles illuminates the democracy that lets every citizen participate, the open climate of the city, its cultural flourishing. Athens is presented as an example for the whole of Greece. He inculcates how Athens' soft power

attempts to heal; curing the plague was beyond human skill. So the Athenians turned to the gods, prayed in the temples and sought divinations, but all this proved fruitless. Their skills remained ineffective and their power to act scientifically or religiously dwindled away.

Gruesome chronicle of a pandemic

Thucydides describes the Athenians as gripped by powerlessness. *Indeed the character of the disease proved such that it baffles description, the violence of the attack being in each case too great for human nature to endure (2.50.1)*. Even animals avoided the corpses lying in the open or became infected if they ate from them. The disease inflicted the weak as well as the strong. People who were cared for died just as those who were left to rot in the streets. Those who showed



far surpasses that of Sparta. The speech was a eulogy but one that invoked strength. How could anyone want to harm such a magnificent city? To this day, this speech is quoted to evoke the glory of classical Athens.

But Thucydides was more subtle. For the next year of the war began with a Spartan invasion of Attica, the countryside around Athens. This invasion was predictable, as the Athenians relied on the superiority of their fleet for invading Spartan territory, and accepted the fact that their enemies could reach the walls of the city, which protected its inhabitants. *And before the Spartans had been many days in Attica the plague began for the first time to show itself among the Athenians (2.47.3)*. Doctors failed in their

character and cared for others fell victims themselves; not even relatives could care for each other. Thucydides penned a gruesome chronicle of the plague: Dying people crawled to the fountains to cool off, corpses covered the streets, some stacked on top of each other. Even the sanctuaries were full of the dead. Burials, the highest duty of relatives in the ancient world, no longer took place in a regular manner; corpses were even thrown among strangers on funeral pyres.

Social order had disintegrated completely and thrown the city into a complete state of anomie. *For where men hitherto practised concealment, that they were not acting purely after their pleasure, they now showed a more careless daring.*

1 Pericles as orator before the Athenian People's Assembly. He was regarded as a politician who was able to steer the Athenians' emotions and thus pursue a consistent policy. He is shown here on a former Greek banknote.



Photo: Thucydides/Wikimedia

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2 The oldest surviving manuscript of Thucydides' historical work, now in the collection of the Biblioteca Medicea Laurenziana in Florence.

3 Greek historian Thucydides (454 – approx. 399 BC) described the effects of the plague on state and society in a fanciful account.



Photo: United Archives/TopFoto/Süddeutsche Zeitung Photo

3

They saw how sudden was the change of fortune in the case both of those who were prosperous and suddenly died, and of those who before had nothing but in a moment were in possession of the property of the others. And so they resolved to get out of life the pleasures which could be had speedily and would satisfy their lusts, regarding their bodies and their wealth alike as transitory. And no one was eager to practise self-denial in prospect of what was esteemed honour.... No fear of gods or law of men restrained (2.53.1-4). Surrounded by death, the only thing that mattered was to derive some pleasure from life; those who committed crimes no longer expected to face punishment. When people claimed that an oracle saying had predicted that war with the Dorians (which included the Spartans) would result in plague, Thucydides comments soberly: The saying would have been interpreted similarly if a famine had struck rather than a plague. Faced with the virulence of the disease, living excessively and imagining that they had seen things coming was all that the people described in Thucydides' work had left.

Disintegration of political order

It is questionable how far the elaborate account of Thucydides can be trusted (Schmitz, 2005 and Pfeifer, 2020), as it is likely to have been

IN A NUTSHELL

- After its victory over the Persians, the city state of Athens emerged as the dominant power in the Aegean. The only remaining rival was Sparta.
- After the outbreak of the Peloponnesian War, Athens was stricken by a plague. Historian Thucydides describes in detail its impacts on society and the state.
- In a speech, he has Pericles evoke the splendour of Athens, the benefits of democracy and the city's cultural flourishing – a stark contrast to the plague that was to befall the city in the war.
- In Thucydides' account, the cruelty of the pandemic made no distinction between rich and poor. Faced with the danger of death, unbridled excess erupted.
- Thucydides' description of the plague entered the Euro-Mediterranean memory and was handed down in literary writings – from Lucretius to Albert Camus.

dramatised. In any case, the Athenians did not slacken in their war efforts and performed new rituals to ward off disease. For decades to come, the city held out against Sparta, winning brilliant victories although they ultimately lost the war. Thucydides intended to show how human order, which seemed so firmly established, disintegrated during the crisis. He initially focuses on the consequences of the plague, but they are not the only cause of the disintegration of order. Those who survived the plague gained immunity and felt a lightness in their future expectations, as if no disease could harm them any-

more (2:51:6). In this regard, the self-confidence of the Athenian population did not shatter that quickly.

What actions can be taken during a pandemic? This question has been on the minds of many in recent months, and probably no one has been spared the feeling of powerlessness. The same question worried the Athenians, who knew nothing about microbes as pathogens and certainly nothing about vaccinations, who had no masks, who at best had an inkling of hygiene rules but who found it difficult to reconcile behavioural changes with their values and way of life. If humans failed to provide a remedy, ancient people turned to the gods, who were seen as the cause of the plague, but they did not help either. People were only concerned with survival and excess was a way of relieving pressure.

Their memory was preserved in Thucydides' account. His work set a tradition for Euro-Mediterranean literature, which has repeatedly dealt with the phenomenon of plague and its effect on human behaviour: Lucretius or Virgil in the Latin world, Boccaccio at the beginning of the Italian Renaissance, Albert Camus or José Saramago in the modern era are only mentioned as famous examples. Plagues even greater than the Plague of Athens have been among the recurring experiences of humanity, including perhaps the first pandemic in the 7th century that reduced the population in many regions of Eurasia dramatically, and the great plague in the 14th century. In modern western societies, on the other hand, experiences of epidemics had been all but forgotten until they surfaced again abruptly in 2020. In the Anthropocene, the awareness of our skills (Könnensbewusstsein) goes so far that in some cases people still expect an epidemic can be conquered completely. "The government" is supposed to work with science to fix it, even if politicians sometimes simulate rather than possess the ability to act. In return, they demand a lot of self-control from the population, which seems to have been successful despite all the fuss. Even coronavirus parties, which people like to complain about, are far from the excesses that Thucydides describes. ●



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In 2015, he received the Leibniz Prize of the German Research Foundation and during 2019 he was awarded the Erwin Stein Prize and became Member of the Institute for Advanced Study at Princeton. Hartmut Leppin is co-editor of the journal "Historische Zeitschrift". His publications include: "Thukydides und die Verfassung der Polis. Ein Beitrag zur politischen Ideengeschichte des 5. Jahrhunderts v. Chr." (Klio-Beihefte NF 1), Berlin 1999, and "Die frühen Christen. Von den Anfängen bis Konstantin", 3rd ed., Munich 2021. His book "Paradoxien der Parrhesie" is forthcoming.

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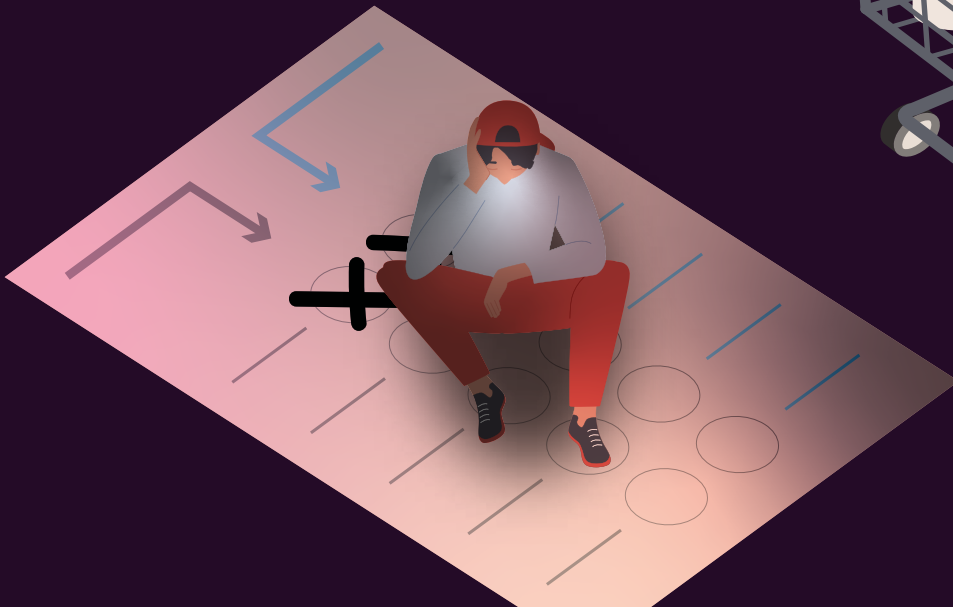
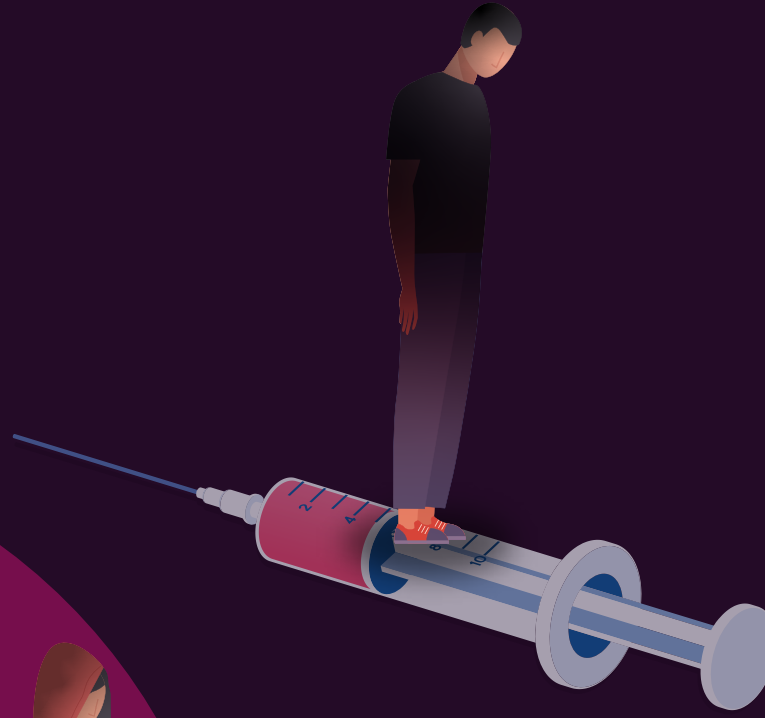
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CORONAVIRUS AS MAGNIFIER



Lockdown of democracy

The pandemic
further afflicts an already
weakened patient

By *Stephan Lessenich*

It is no secret that democracy is not in the best shape, whether as a political form of government or as a social way of life. Particularly in Germany, acceptance of democratic processes and relationships depends on their output – i.e. “what comes out at the end”, as a former German Chancellor used to say in a memorably down-to-earth style. And it is precisely this output that shows signs of weakness. “Politics,” as people like to say, do not deliver, and have not for quite some time now. A socio-political system, however, that lives off its formal and material ability to perform, but which cannot reliably deliver the desired results, has a problem – possibly even an existential one.

The so-called “coronavirus crisis” – only the latest in a series of shocks to democracy over the past years – has mercilessly demonstrated the performance limits of democratic capitalism in its post-industrial guise. And even if Germany’s nimbus as the world champion in thoroughness, which it has diligently nurtured itself, has already been thoroughly shattered – when it comes to delegitimising democracy, the country is proving to be extremely effective.

This is quite obvious at the formal level of political procedures: The steering ability or rather inability of the German multi-level system of political decision-making is remarkable. The supposedly collective crisis management of the federal and state governments is an impressive indictment of the much-praised federalism – because it is not a collective system at all. Federalism has gone from being the constitutionally intended protective wall against hierarchical, authoritarian “rule from above” to an institutional guarantor of organised irresponsibility. This is not only due to the “joint-decision trap” well known to political scientists, i.e. the fact that the founding fathers wanted the executive powers at the various territorial levels to keep each other in check and ultimately let the smaller unit regulate what it can regulate most appropriately. What the designers of post-

war federalism had not reckoned with, however, was the executive particularism that has by now taken on almost identitarian features, even in the case of political artefacts such as (please forgive me!) “Rhineland-Palatinate” or “Saxony-Anhalt”. And they probably reckoned even less with the largely unrestrained competition for prestige that is not only driven by political structures but also by the unleashed personality

structures of politicians posing as state princes who command the immediate closure of DIY stores (flower shops, nail salons, etc.) in the truest sense of a fool’s decree, only to declare their reopening the very next day. And all the while, the parliaments remain silent.

The fact that the German federal-state system can be, and in fact is, a toxic concoction in times of the pandemic makes it seem inappropriate to adopt an ironic tone here. If we understand democracy not only as a system of politically mediated norm-setting but also as a political structure that enables the general and equal participation of citizens in society’s functional and benefit systems, it becomes all the clearer what is wrong with actually existing democracy. Because in this regard its output is nothing short of scandalous. COVID-19 also makes this more obvious than ever: The probability of infection, the risk of severe disease, the economic impact of the pandemic and of the political measures meant to contain it are all profoundly socially structured in our democratic society.

In other words: They are distributed unequally. One year of “coronavirus crisis” brings the iron laws of the democratic-capitalist welfare state, particularly in its German version, into consciousness: Those who are poor live shorter lives, have a demonstrably lower “healthy life expectancy”, fewer educational opportunities and a high risk of “bequeathing” their social position to the next family generation, which, for its part, is not just economically disadvantaged from birth, but socially and in fact vitally

What is the pandemic doing to our society? How is the coronavirus affecting democracy? Affecting the relationship between the generations and degradation of the environment? The articles in this chapter get to the bottom of these and other questions.

Can democracy still be saved?
For that to happen, the lockdown on democratic practices and utopian ideas would have to be lifted as soon as possible, says Stephan Lessenich.



deprived as well. However, this is not merely a socio-statistical fact that could possibly be blamed, as behavioural economics is eager to do, on those affected. No: It is a systemic problem of the systematically unequal guarantee of life chances (in the literal sense) and thus truly a political-democratic scandal.

Faced with the social constellation of an output crisis in democratic welfare capitalism, it is not only confused minds or fascist manipulators but possibly also segments of the “middle classes” so often invoked as an anchor of social stability who are turning their backs on “politics” – which ultimately means nothing else than that they are turning their backs on the democratic idea of a self-governing society. The intentionally or unintentionally anti-democratic practices that are rampant in this process of turning away from politics range from apathy and distancing to aggression and destructive impulses. While some think that those in power have nothing more to say to them and do not want to hear anything from them, others are in a position to simply carry on with their individual, family or milieu-exclusive thing. For some, this might mean protesting at demonstrations against the coronavirus, for others flying abroad at the first opportunity, for others yet home-schooling their already privileged offspring, and finally there are those who just keep trying to make ends meet. And they are all united in their inner farewell to democracy as both a political system and a form of social life.

What could be done to counter this? Venture more output? The traditional means of material and economic stabilisation from the supposedly “golden age” of democracy back in the 1970s (or was it the 1960s?) will not be available in the future, or at least only at the price of devastating socio-ecological effects here and – for the time being – especially elsewhere. If the traditional ideology of “a lot helps a lot” of democratic output is out of the question today, then what is needed from now on is not *more* but a *different* output: a truly fundamental reform of political institutions on the formal side, a massive redistribution of socioeconomic resources in favour of the classes with few opportunities on the material side.

Above all, however, what is needed, and what is in fact a structural prerequisite for a different *output* of democracy, is firstly more and secondly a changed democratic *input*. This is by no means just a matter of increasing the voter turnout of the “lower classes,” i.e. about shaking, or even better breaking, the electoral and thus also discursive dominance of the (upper) middle classes – although this is also important. But it is also about other forms of political participation and co-determination, about demo-

cratising democracy. The idea of institutionalising a “consultative body” as a fourth or fifth power (depending on how it is counted) points in this direction, as does the idea of social transformation councils that think globally and act locally and that, for example, address the question of how the risk of a permanent pandemic state can be reduced by radically changing our ways of interacting with nature.

Whatever name you may want to give to the new organisational forms of a democratised democracy, the political search for them sends a message to society that things cannot go on as they are now. To borrow from Erich Kästner (1932), there is no way this can keep going if it keeps going like this. Ending the curfew for democratic practices and utopian ideas: This is the most urgent political issue in the times of the pandemic. ●



The author

Stephan Lessenich, born in 1965, studied political science, sociology and history in Marburg. He earned his doctoral degree in Bremen in 1993 and in 2002 received the *venia legendi* (authorisation to teach) in sociology at the University of Göttingen. His first professorship took him to the University of Jena, where together with Klaus Dörre and Hartmut Rosa he was responsible for initiating the Centre for Advanced Studies in Social Sciences and Humanities of the German Research Foundation entitled “Post-Growth Societies”. In 2014, Lessenich was called to the Chair for Social Developments and Structures at the Department of Sociology of LMU Munich, as successor to Ulrich Beck. Lessenich also plays a proactive role in social processes: He is, for example, a member of the scientific advisory board of the Basic Income Network (*Netzwerk Grundeinkommen*) and was co-founder of the “mut” party in Bavaria. He has been professor of sociology and director of the Institute for Social Research since 1 July 2021.

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The illusion of endless awakening

Socio-psychological aspects of crisis management or lessons that could be learned from the pandemic

By Vera King

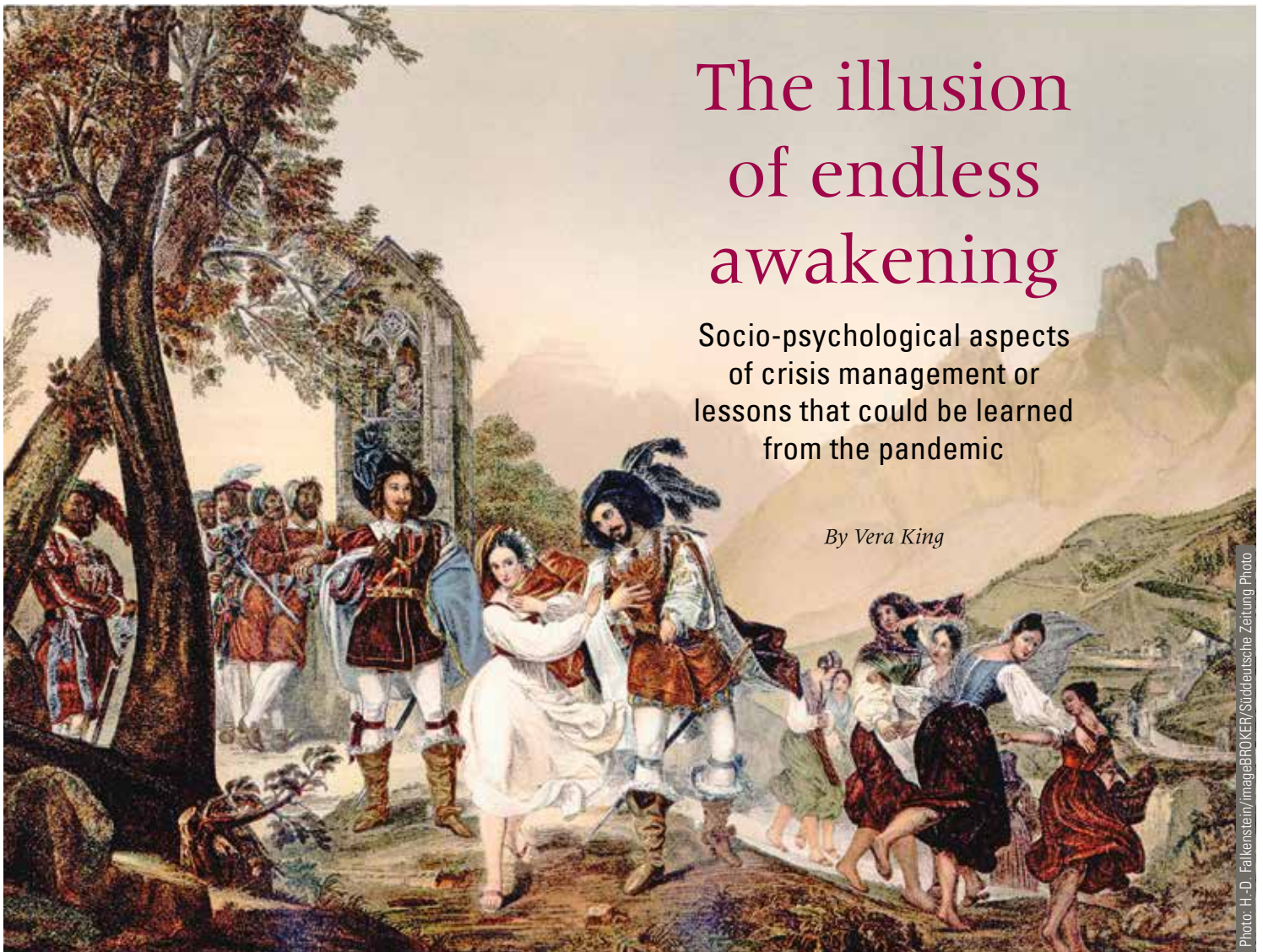


Photo: H.-D. Falkenstein/imageBROKER/Stadteutsche Zeitung Photo

During the coronavirus pandemic, the illusion of “endless awakening” and perpetual optimisation has gradually become undeniable. But there is still a lack of sustainable change, also in view of the ecological crisis. Without significant rethinking, it is likely that these threats will also be suppressed by the same mechanisms that have occurred throughout history in times of crisis. The grave consequences of trivialisation and denial have also been expressed in literature dealing with the Black Death.

Coveted youth: Feudal lord Don Rodrigo has cast a lustful eye on young Lucia, forcing her to flee with her groom, Renzo. This picture portrays a scene from Manzoni's novel “I Promessi Sposi”, which also describes in detail the events surrounding the plague in Milan in 1630.

Alessandro Manzoni's famous 1827 novel “I Promessi Sposi” (English: “The Betrothed”) describes the events surrounding the Milan plague around 1630 in an evocative and emotional narrative. The work, which is considered the first example of the modern Italian novel, also impressively describes

in socio-psychological terms that which Umberto Eco was later to call “mass delusion” (1989: 932), referring to how populations deal with existential threats. Manzoni's narrator reports on the beginning of the epidemic: “Anyone who mentioned the danger of the pestilence, whether in the streets, in shops or in private houses – anyone who even mentioned the word ‘plague’ – was greeted with incredulous mockery or angry contempt.” (569). As vividly as a film, the horrors of the plague unfold, aggravated by trivialisation and denial; the search for scapegoats and acts of violence that are not far removed from our present situation: “The main odium fell on two doctors... The situation of those two men... was certainly strange and worthy of record, as they saw a terrible catastrophe coming nearer and nearer and did everything they could to avert it; and at the same time encountered obstacles where they looked for help, became the butt of popular indignation and were regarded as enemies of their country.” (572) This behaviour is eerily familiar to how people have behaved during the coronavirus pandemic, ranging from prudent concern

to failing to grasp reality and facing down professionals who bring bad news with hostile indignation.

Manzoni's narrator reflects ironically on the different phases and variations of avoiding reality: *"In the beginning, there had been no plague, no pestilence, none at all, not on any account. The very words had been forbidden. ... Then it was 'not a real pestilence' – that is to say, it was a pestilence, but only in a certain sense; ... Last of all, it became a pestilence without any doubt or argument – but now a new idea was attached to it, the idea of poisoning and witchcraft, and this corrupted and confused the sense conveyed by the dreaded word, which could now no longer be suppressed."* (582). Avoiding reality is a method of self-assurance and maintaining a sense of security as an individual, even if it is only the belief that one simply cannot be mistaken, even at the cost of increasing the risk that is associated with being wrong.

In the current pandemic, there have been many examples of how frustration and helplessness caused by an invisible virus that is a potential threat to everyone and restricts our daily lives can spill over into anger against people we believe are responsible. Although few still

believe in witchcraft today, conspiracy theories and paranoid-aggressive phantasms are still present in our society. Fingers are often pointed at the very people who are expected to rectify the situation but who can hardly be expected to console extreme degrees of fear and uncertainty, regardless of how honourable their intentions are. Nobody can foresee the course of the pandemic and this places society under a great burden, a discomforting position which often provokes negative interpretations of state interventions as acts of tyranny. When grave mistakes are made publicly and political control appears to fail repeatedly, it only intensifies misgivings and mistrust. Mistakes that are made in response to existential threats can have fatal consequences, but denying that the threat exists at all can be just as deadly.

Endless optimisation as a strategy for coping with morality

Social-psychological mechanisms for dealing with epidemics have been documented throughout history and in literature, but the current situation demands a new rule book. The coronavirus has not only fundamentally changed society and amplified many of the threats, fears and alternative ways of thinking that exist today, it has also challenged our contemporary patterns of coping with mortality. How we now perceive our own mortality has not only become more imposing as sickness and death are more present than before the pandemic, the threat of mortality is gnawing away at us because existing cultural patterns and strategies for coping with it are no longer working.

In contemporary cultures, we attempt to mask the fact that our lives will eventually come to an end on many levels by attempting to control time as a resource, gaining in efficiency and trying to pack as much into our lives as humanly possible. To "get more out of the world" as Blumenberg (2001:73) puts it, our lives must be dominated by the principles of speed and performance in many aspects (King, Gerisch, Rosa, 2021). Speed and performance appear to be the inescapable conditions of adding value in contemporary society, enabling a manic way of experiencing the world in which we perceive boundaries, including restrictions of the self and our bodies as temporary limits that can be overcome, forcing our mortality further into the background. We can package these patterns into the metaphor of "perpetual optimisation", accentuating the paradoxical unity of perpetual new beginnings and the never-ending not yet (King 2020).

How we deal with mortality, age and our limitations affects our relationships with following generations. Consequently, when older

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IN A NUTSHELL

- Alessandro Manzoni described trivialisation, denial and the aggressive search for scapegoats during the Black Death in 1630 in his famous novel "I Promessi Sposi" (English: "The Betrothed").
- Similar psychosocial strategies and patterns of behaviour have arisen during the coronavirus pandemic, including aggressive accusations against the people responsible for fighting the pandemic.
- The current pandemic is challenging how mortality has been dealt with throughout late modernity and in contemporary society. Defence mechanisms no longer function when death is lurking behind every corner.
- Endless awakening and perpetual optimisation in contemporary society masks the conflict between generations and shows little consideration towards conserving limited resources. This scenario has begun to fracture during the coronavirus pandemic and presents an opportunity for rethinking our approach to the environmental crisis which poses a greater existential threat.



Photo: Rue des Archives/RDA/Süddeutsche Zeitung

Manzoni describes the experience of Milan physician Ludovico Setta during the plague as follows: “One day, when he went out in his sedan chair to visit his patients, a crowd began to gather round him, shouting that he was the ringleader of those who wanted there to be a plague at all costs and that he was the one terrifying the whole city (...) – and all just to improve business for the doctors. The crowd quickly grew larger and angrier (...). This was his reward for having judged things correctly, spoken the truth...” That almost sounds like the description of the lateral thinking movement of our times.



Photo: Florian Boillot/Süddeutsche Zeitung



Photo: Florian Boillot/Süddeutsche Zeitung

people create generational tension, it reflects a form of coping with mortality. This is evident from the following example. The essential conflict between generations demonstrated when older people treat younger people with contempt for bringing new ideas into the world is also an attempt to defend themselves against their own limitations, as younger generations will eventually survive them. This tension between generations can be expressed in a rejection of youth and the new, which includes the pain and anger experienced by older people in view of their own limitations.

However, this context is changing in our contemporary society. If perpetual optimisation has become a goal for everyone and no longer just the young, a defence strategy targeting young people is hardly appropriate. Instead, we can identify a functional pattern of idealising rather than rejecting the new. Older people are

now staking their claim to perpetual optimisation, innovation and new beginnings in an effort to stay young. This development is supported from both sides due to social and economic pressure on the one hand and masking mortality on the other, explaining its effectiveness. It is difficult to escape the pressure to conform, and denying individual limitations is also attractive, propelling youthfulness into a quality that permanently mobile, flexible, innovative older people are also claiming for themselves. Tension between generations in contemporary society is therefore more commonly manifested in the concealment of boundaries and generational differences rather than an explicit conflict between generations.

Denial or generative responsibility

What is often harmlessly dismissed as an “ideal of youthfulness” also has more sinister implica-

tions. If we disregard the implicit age racism that the cultural pattern of perpetual optimisation exhibits by shrouding limitations, including the impermanence of life itself, we can also observe a latent aggressive lack of consideration towards our descendants through the radical orientation of our society with regard to the present. We might choose to put it this way: Right now we are using the world's resources without showing any concern for future generations. As a consequence, means of production dominate that are focused on short-term increases rather than sustainability, instead of making the transition to a generative way of thinking (Latour, 2000) that will protect the environment for coming generations, long beyond the lifespan of an older generation. Although the destructive and illusionary dimension of perpetual optimisation and endless awakening is palpable, it has become a tenacious and hegemonic cultural pattern, not only because of its economic potential, but also due to the perceived benefit of ignoring mortality.

But this pattern has also changed, at least gradually, during the coronavirus pandemic, as we are confronted with more prominent images of death and mortality. Living under the pressure of perpetual optimisation, progress, performance and constant mobility have been interrupted in many areas of our lives during lockdown. Differences in age and between generations have also become more evident than ever. Younger people are less at risk than those who are older, despite how young older people might appear to be. At the same time, older people are now demanding the same consideration from younger people that they have failed to show themselves towards future generations, in a broader rather than an individual sense, insofar as an environmental crisis can be seen as being caused by the ignorance of an older generation towards future generations.

Thus the illusion of "endless awakening" and perpetual optimisation as a cultural pattern of processing and defending against transience has developed cracks during the coronavirus pandemic: in normative, psychosocial and practical terms. Meanwhile, the environmental crisis facing our planet remains a smoking gun, although the pandemic has proven a significant distraction. Attempts to combat this crisis, insofar as that is even possible, could benefit from recurrent evidence which suggests restricting perpetual optimisation is achievable and more sustainable for the benefit of future generations. Unless there is a significant change in thinking, the existential threats of environmental degradation and climate change will continue to be trivialised by similar mechanisms of distorting reality as described by Manzoni 200 years ago. The

only difference being that the threats posed by environmental and climate change are far more insidious and have even graver global consequences than the Black Death. Echoing his description of plague denial, Manzoni might have written today: *"At the start, the environmental crisis didn't exist, just saying the word was frowned upon; then there was climate change but only natural climate change; finally, total environmental destruction without a shadow of a doubt. But soon our attention turned to other ideas, such as the scapegoats of the crisis, who were then either branded or sacrificed."* For a fighting chance of a better future, we need to adopt a position of generative responsibility. ●



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Being there for a dying person in their final hours is often very important for their relatives. During the pandemic, however, this is often not possible.

Photo: Chinnapong/shutterstock

Dying without saying “Goodbye”

During the pandemic, social distancing applies for the sick and dying too

By Anke Sauter

Losing a loved one is difficult. Losing them without being there for them at the end is for many people almost unbearable. The contact restrictions during the pandemic are demanding a lot from all of us, but especially when dealing with serious illnesses, dying and death. This is not without consequences for the grieving process.

A fall at home, a broken bone with a foreseeably protracted healing process – these were the start of a tale of woe that ended with death. Because of the risk of infection, the patient, we can call her Ms M., was not allowed any visitors for weeks. The coronavirus found its way into the hospital nonetheless: It was probably a physiotherapist who brought it in. Several patients fell ill, including Ms M. It was only when her health took a severe turn for the worse that her children were allowed to visit her. After many weeks, they saw their mother for the first time again – on her deathbed. To know how much she had suffered from loneliness was almost as painful as her death itself.

An example from the second wave of the coronavirus – and there are presumably many others. In times of the pandemic, falling seriously ill is particularly hard, not just as far as the coronavirus is concerned. No wonder many people are shying away from going to the doctor for fear of having to go to hospital and being separated from their relatives. This is how illnesses are protracted that could actually still have been cured. Those who are seriously ill and do end up in hospital have to forego all contact with their loved ones because of the risk of infection. That is the one side of the coin. The

other side is that of the relatives, and it is no less difficult. Although hospital staff do their best to reassure patients and keep families informed, they are themselves often overworked and at the end of their tether. And being told by nurses is not the same as a visit. Especially COVID-19 patients are often without their relatives even in their final hours because of the high risk of infection.

Anger, guilt and longing as a normal grief reaction

Sandra Zulauf, a young psychologist working on the PROGRID project, which aims to help people with prolonged grief, has observed: “This helplessness, the feeling of not being there for someone, that is very bad for people.” The loss of control often leads to anger towards staff, but also to a sense of guilt, she says. Thoughts go round and round in circles: Should I have been more insistent about being allowed in to see my mother? Anger, sense of guilt, overwhelming longing – all these are normal reactions when a person close to us dies. Sometimes, however, time does not seem to heal all wounds – on the contrary: Everything just gets worse and worse.

We speak of “prolonged grief” when people are still filled with extreme longing many months after a relative’s death and refuse to accept that it was “Goodbye” forever. “Some widows set a place for their husband at the table every day, parents who have lost their child keep everything in their dead son’s room exactly the same for years,” says Regina Steil, professor of psychology at Goethe University and head of the Frankfurt study centre within the PROGRID project. Other possible symptoms are the feeling of loneliness, self-reproach, but also suppressing memories of the deceased. Many affected people still have difficulties coping with everyday life long after the person’s death. Regina Steil is glad that “prolonged grief disorder” (PGD) has now been acknowledged as a mental disorder by the WHO and included in the International Statistical Classification of Diseases and Related Health Problems. “It’s not about stigmatising those in mourning. It’s quite normal for people to suffer very badly from losing a relative. But if this suffering doesn’t diminish, then it can have serious consequences. These people can now be helped,” says Steil.

Risk factors for prolonged grief disorder

About 4 per cent of all people in mourning develop such a grief disorder. Are there risk factors that encourage it? “Various studies show: If the death is unforeseen, if it occurs in the ‘wrong order’ within the generations, if it was a violent death at the hands of a third party – or the rela-

tive died in intensive care, these are aspects that increase the probability of prolonged grief disorder,” says Regina Steil. The dramatic scenes in an ICU also foster a problematic development. “When an elderly father, advanced in years, dies in his bed after a long period needing care, then that’s rather an event which is to be expected,” says Steil. And yet even in such apparently undramatic circumstances there are cases where a person’s grief threatens to be all-consuming. “This is often connected with the deceased person, with the relationship,” she explains.

In the pandemic, the probability of prolonged grief disorder increases as a result, for example, of relatives becoming ensnared in a sense of guilt because they could not accompany the dying person to the end, and this is additionally intensified by the environment in the ICU. “I should have insisted on being with him. I didn’t understand what a bad state he was in and let them send me away too easily” – people’s thoughts revolve around such self-reproaches. Being with a dying person until their last breath gives us a good feeling, says Steil. Because being close especially to COVID-19 patients is only possible under very strict regulations for reasons of protection and due to the risk of infection, saying “Goodbye” in a dignified manner is almost impossible.

As a consequence, the person’s death often remains abstract. And the subsequent rituals for coping with it also remain abstract – however different they may be in different cultures. “All over the world, mourning means closing ranks with other people, also physically. But that is also only possible to a very limited degree during the pandemic,” says Steil. The funeral ser-

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Regina Steil, born in 1965, is professor in the Department of Clinical Psychology and Psychotherapy of the Institute of Psychology at Goethe University. She studied psychology at the universities of Marburg and Jena, completed her doctorate in Göttingen and Oxford and was senior psychologist in the Department of Psychosomatic Medicine and Psychotherapy at the Central Institute of Mental Health in Mannheim from 2004 to 2008. She has been scientific director of the Centre for Psychotherapy at Goethe University since 2008. She also heads, among others, the Frankfurt study centre within the PROGRID project on the treatment of prolonged grief disorder, which is funded by the German Research Foundation.

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In mourning and lonely: People who have lost a close relative during the pandemic often suffer additionally from the contact restrictions in place.

vice at the cemetery, insofar as guests are permitted at all, is subject to social distancing rules, closest family members sit two metres apart in the chapel without being able to lean on each other. A wake afterwards with coffee and cake and chatting about shared memories are out of the question, and so relatives often feel lonelier than they would in “normal” times, left alone with their sorrow and their thoughts going round in circles.

PROGRID study on behavioural therapy approaches

Most people will somehow overcome the loss, even in times of the pandemic. Yet what about those whose grief does not disappear by itself, but instead becomes chronic, as psychologists say? “Possible consequences are substance dependence, that is, addiction, psychosomatic disorders such as autoimmune diseases, but also depression leading to suicide,” Steil says. That is why it is so important to recognise the problem in good time and to help. The PROGRID project funded by the German Research Foundation, in which Goethe University is collaborating with the universities of Eichstätt-Ingolstadt, Leipzig and Marburg, is comparing two different behavioural therapy approaches. One approach focuses on the practical side of life and tries to find solutions for everyday problems together with the patient. The other approach centres on the relationship with the deceased, the sense of guilt, the anger, the longing. Both approaches have proven successful for various problems, says Steil, adding that the aim now is for them to benefit people with prolonged grief disorder as well. Treatment includes a detailed anamnesis, around 20 weekly personal therapy sessions as well as short- and medium-term check-ups. Treatment within the PROGRID project is financed by the health insurers.

Were the contact restrictions during the pandemic too harsh, especially for old people’s homes and hospitals, because they led to irre-

versible damage on both sides? “I wouldn’t put it like that. It was always a question of weighing up the health risks,” says Steil. However, she adds, this aspect of COVID reality needs to be looked at in more detail: Were there more people with depression? More suicides? And the situation of hospital staff also needs to be examined more closely, she says, as it is intrinsically related to relatives’ suffering. ●



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IN A NUTSHELL

- The contact restrictions during the pandemic demand a lot especially from the relatives of the dying. Because they cannot be with their loved ones in their most difficult hour, many people are haunted by a sense of guilt.
- The comfort that comes from mourning together is also more or less lost: Keeping a distance is the order of the day, even at funerals and during the time afterwards.
- If the grief still does not diminish even after months have passed, it could be a case of “prolonged grief disorder”, a medical condition that has only recently been acknowledged as a diagnosis. Typical symptoms are physical or mental problems, suppressing memories, problems coping with everyday life as usual.
- The PROGRID project at Goethe University funded by the German Research Foundation offers help to affected persons. Two different behavioural therapy approaches are used – one focuses on the grief itself, the other on the everyday problems it causes.

Believing the good is possible

Philosopher
Claudia Blöser
is studying
the nature,
norms and
functions of hope

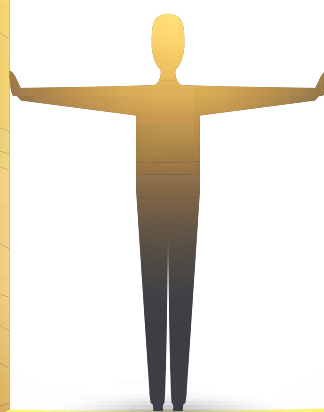
In her provocative speech before the United Nations, Greta Thunberg insisted: "I don't want your hope. I don't want you to be hopeful." A radical rejection of hope! Does hope in a crisis entice us towards deceptive optimism?

Claudia Blöser: One reason for Greta Thunberg's rejection of hope could be that she, like many of us, equates hope with optimism. Well, it's precisely one of philosophy's tasks to suggest how we can distinguish between different concepts. Philosophy mostly characterises optimism as a notion that regards something we wish for as probable. Hope, by contrast, has nothing to do with probabilities. Hope focuses on the possibility of something. We can also hope for something that is extremely improbable. What's more, optimism is also often associated with wrongly assuming a too high level of probability. Our answer to Greta Thunberg could therefore be: It is not probable, perhaps even improbable, that we will get the climate crisis under control and so we should not be optimistic. But it's perfectly reasonable to be hopeful because a good outcome is still possible.

The second assumption behind Thunberg's words: Hope induces passivity, that is, restrains us from taking action.

Hope can indeed lead to passivity. But that is not necessarily connected to the concept of hope. It's instead rather due to the attitude of the hopeful person. If they know that they can and must do something for this hope, then hope even fosters motivation – because hope reminds them of the possibility of being successful.

In times of crisis, people look for a sign of hope. Hope is also at the centre of philosopher Claudia Blöser's research. A conversation with her about the relationship between hope, knowledge and fear and why the concept of radical hope can be helpful in a crisis.





Does this mean that hope needs very precise knowledge as a basis, a reason on which it can build?

Whether hope needs reasons is disputed in philosophy. The consensus, however, is that hope should be consistent with the available evidence. Philosophy is not only interested in the nature of hope and its function of fostering motivation. An important philosophical question is also what is reasonable, that is, “rational” hope. Immanuel Kant considers the normative question “What may I hope?” to be one of the central questions of philosophy. His hypothesis, which is still largely shared today, is that we may not hope for something that we must assume is impossible. Rational hope therefore presupposes that we can clearly see the actual state of affairs. Doubts, however, can

“Reasonable hope needs clear-sightedness.”

exist in this context, they are by all means part of the uncertain situation of the hopeful person.

In the coronavirus crisis, some people are drawing hope from the idea that a life in harmony with nature, renouncing capitalism, digitalisation and industrial agriculture, activates their self-healing powers in such a way that the virus cannot affect them. They too evidently assume that their hope is based on knowledge.

As I said, reasonable hope needs clear-sightedness. This also includes taking

into consideration new, relevant evidence that might lead us to question a particular hope. Conspiracy narratives often presuppose a kind of so-called “knowledge” that is inconsistent with our sciences and immunised against new evidence. Hopes founded on this are deceptive because they are accompanied by false assumptions about the virus. False hopes can, however, also be found aside of conspiracy myths: For example, young athletes have reported hoping that their physical fitness will protect them from the virus. This too can quickly prove to be false. In addition, hopes can be criticisable if they lead to actions that harm others or expose them to an unjustifiable risk.

For Kant, hope and knowledge belong together insofar as hope begins at

ABOUT CLAUDIA BLÖSER



Claudia Blöser, born in 1980, has been a post-doctoral researcher at the Institute of Philosophy of Goethe University since 2013. In her post-doctoral research project (Habilitation), she is studying the nature, norms and functions of hope. Her research work centres on practical philosophy, with a historical emphasis on Immanuel Kant and a systematic focus on moral psychology. Blöser studied physics and philosophy at Goethe University and the University of St Andrews (Scotland) and has also

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Anyone wishing to learn more about the philosophy of hope, also in historical development, can consult the following encyclopaedia article:

Blöser, Claudia and Stahl, Titus: “Hope”, The Stanford Encyclopedia of Philosophy (Spring 2017 Edition), Edward N. Zalta (ed.), <https://plato.stanford.edu/archives/spr2017/entries/hope/>>.
entries/hope

the point where our knowledge ends. Hope belongs to the realm of faith, of religious experience. What does this view mean for a non-religious understanding of the world?

People who are not religious share Kant's assumption too: Hope comes into play at the point where we reach our limits, that is, limits of knowledge and of action. It's just that Kant has a specific object of hope in mind, namely a comprehensive idea of justice in which those who act morally are also happy – so where morality and happiness coincide. In his opinion, we can only hope for this state of comprehensive justice if we assume that there is a God who creates this state. God and a firm belief in Him are the foundation underpinning this hope. That is why Kant also speaks of "sure" hope. Nowadays, many people no longer go along with this. For those who do not believe in a firm reason for their hope, hope can flip over into a state of fear again and again. That is why secular hopes are typically fragile states.

Do fear and hope belong together?

Spinoza would have answered: They necessarily belong together because both issue from a situation of uncertainty. Fear, however, focuses on a negative possibility in the future, whereas

"The key feature of radical hope is that it is directed towards something that is good, even if we cannot yet put a name to it."

hope gives what is good a chance. Fear and hope are, so to speak, the two sides of the same coin.

In times of crisis, we become aware that life is fragile, vulnerable and uncontrollable. Philosopher Jonathan Lear has developed the concept of radical hope for this – using the example of the Crow Indians, whose way of life and culture were destroyed in the mid-19th century.

Lear thinks about how we can imagine a future when all values and habits valid so far no longer mean anything.

Radical hope is a concept that can guide us in the current situation. The key feature of radical hope is that it has no specific object but is directed towards something that is good, even if we cannot yet say how this might look. Radical hope holds on to the fact that something good is in principle always possible and can transcend our imagination. In the coronavirus crisis, we're having to forego many things that we've considered important for our "good life". Radical hope allows us to be open to the idea that good could show itself in a completely new way in the crisis too.

Hope therefore has something to do with imagining that something is possible even under the most adverse circumstances. Radical hope even considers something entirely new to be possible and gives us the courage to be open to something new.

Definitely! A concrete hope can also be very constricting for us. We could call this a conservative hope, a hope that seeks to preserve. The other kind would be a revolutionary hope, which places its bets on something new that was not expected.

It is possible to consciously decide to be hopeful in a hopeless situation? Is there such a thing as the "courage to hope"?

Some philosophers do indeed assume that a person can decide to be hopeful, and they then also devise their concept of hope in such a way that a decision really is possible. They assume, for example, that you can focus mentally on possibility and not on improbability. And that, of course, also goes hand in hand with the possibility of deciding on what to focus. Others understand hope as a gift that in a way is given to you. I also tend towards this second view. A person with no hope and in despair would choose hope if they could. We can, however, try to cultivate hope. Fellow human beings are often also important for this, with whom we can think together about how what we're hoping for could be achieved.



French writer and Nobel Prize laureate Albert Camus assumes that a person without hope can even be happy. In her book 'Annette, ein Heldinnenepose', the writer Anne Weber translates Camus as saying that the struggle, the constant toil and effort towards great heights is enough to fill a man's heart, and that this is why we best imagine Sisyphus happy. Can we live well without hope?

Camus' message is that there is no "greater purpose" and thus no hope that goes beyond this life – and that we don't need such hope in any case in order to be happy. I find it helpful to see Sisyphus as a metaphor for the fact that we can value activities for their own sake too and are therefore neither dependent on the hope of being successful with our activities nor on the hope that there is an ultimate goal for which all effort is worthwhile.

But it would be rash to conclude that we can manage entirely without hope. Phenomenological approaches in philosophy point out that there is a "pre-intentional" hope, which does not focus on concrete objects but instead gives us an idea, in a mood-like way, of a future which in principle holds some good possibilities. This hope resembles "radical" hope, but it takes the form of an existential feeling that must not necessarily be conscious. That such hope is indeed necessary for a good life can be seen in cases where this hope is lacking, such as depression.

"We can try to cultivate hope."

Assuming that political utopias are also politically formulated hopes: Can hopes be shared?

First of all, hope is an individual phenomenon. Everyone has *their own* hopes. Sharing hopes would mean that several people hope that a certain state will be achieved – and at best also know that they are not alone with their hope. Such hopes have the power to unite. Political utopias are a special example of this; they are blueprints of just societies.

In view of climate change, you might think that today we're only sharing a dystopia – the climate disaster as a threat that is or can be an object of shared *fear*. In relation to the coronavirus crisis too, one could lament a certain hopelessness in the sense that a shared vision of a good future is missing. Is survival really the goal to which everything else should be subordinated – you only have to think of the threatened existence of those working in the cultural sector? Or is the justified hope for other goals not also part of a good life? In my opinion, we're seeing hope glimmering in the background in the coronavirus crisis too that can and is being shared – hope for more solidarity, such as in

"In the coronavirus crisis too, we're seeing hope glimmering in the background."

neighbourhood help, for better cohesion, for less consumption, for greater respect of nature. In addition, the coronavirus crisis acts as a magnifying glass for injustices and in so doing draws attention, for example, to the situation of people in precarious employment. We can pin our hopes on this that these injustices will be addressed more resolutely.

You've been dealing with hope in your post-doctoral research for several years now. Are there any findings about hope that have surprised you?

Yes – I hadn't expected it to be so difficult to say what hope actually is. Especially in analytical philosophy, attempts are always made to define concepts and to find the necessary and adequate criteria. However, after careful consideration I've come to the conclusion that searching for such a definition doesn't get us any further. But that doesn't mean that philosophy is unable to say anything enlightening about hope. Not offering a definition only means not reducing hope to simpler constituents. In my work, I'm looking at the irreducible concept of hope in terms, among others, of the norms to which rational and – in a

broader sense – successful hope is subject as well as in terms of the functions of hope in concrete contexts.

The interview was conducted by Pia Barth.

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RECOMMENDED READING

Why we cannot return to “normality”

The anthology “Jenseits von Corona” (“Beyond the Coronavirus”) looks at the social consequences of the pandemic

The most important things come unexpectedly. The future, the imminent, is rarely the fulfilment of that which has long been in the offing or yearned for.” How true are the words spoken by Botho Strauß in an interview with the “Spiegel” magazine in 2019. In the past months, we have become witnesses to a “multiple shock to the system”, which many had considered inconceivable. And now? 32 renowned German scholars have looked from the standpoint of their respective disciplines at how things might continue “beyond the coronavirus”.

The book, over 300 pages long and published in September 2020 by Bernd Kortmann and Günther Schulz, directors at the Freiburg Institute for Advanced Studies, offers an insightful overview, especially from the perspective of the social sciences and cultural studies: The articles shed light on very different, sometimes also controversial aspects of the consequences of the coronavirus; they provide orientation, but no simple answers in complex times of crisis. As historian Jürgen Osterhammel says: “We are all caught up in a gigantic experiment, which as social scientists we can, however, observe from a certain distance.” The global village of the 1990s has now been supplanted by the global patient of the 2020s. The authors share a common view: Crises are times of reflection. And perhaps we should now use this time of reflection to fundamentally question outdated societal thinking patterns.

We are on the brink of a new era

The one or other analysis in the book (from April 2020) would presumably be even more pointed from today’s perspective, for example when it comes to political action during the pandemic. There is, in any case, broad consensus that we are on the brink of a new era and that there will be no going back to the old normality. In this context, religious studies scholar Birgit Meyer cites what she read on posters during her daily coronavirus-induced walks round Amsterdam: “We can-



Kortmann, Bernd, Schulze, Günther G. (eds.)

Jenseits von Corona, Unsere Welt nach der Pandemie – Perspektiven aus der Wissenschaft

transcript Verlag, Bielefeld 2020, ISBN 978-3-8376-5517-9, 314 pages, € 22,50

not return to what was normal because it was the normal that was precisely the problem.” The articles in the anthology make it clear where things have become acute and what made them acute in the first place, that is, the lack of effort made in tackling the central issues on our planet: climate change, social inequalities in the world, gender and generational justice, racism, migration, violation of human rights, and the future of the global order between multilateralism and nationalism.

The scholars do more than just list the buzzwords. Instead, they address concrete problems. Philosopher Markus Gabriel, for example, hopes “that the starting shot of the pandemic response in Europe has led to a moral insight into the weak points of the global and local production chains of our consumer behaviour.” The aim must be a “morally progressive post-colonial order”. Social anthropologist Shalini Randeria makes the point that innovative institutional solutions are needed in order to distribute vaccines more equitably around the world. Vaccines and public health should be considered a public good accessible to all, a global common – and she makes reference to a statement by UN Secretary-General António Guterres. The effects of neoliberalism on the health system of Western countries do not go unmentioned either: Privatisation frequently happened without the

necessary “healthcare reserves”, as is becoming clear during the pandemic in the shape of limited hospital capacities.

While some authors see unbridled growth as one of the greatest problems for climate, nature and humanity, economist Lars Feld is more critical of protectionism, which threatens international trade relations, he says. He registers a severe productivity shock that will not be easy to overcome. But “a return to the old path of growth can be expected, so that GDP will find the way back to its former momentum.” And Feld points out that consistent CO₂ pricing could have a positive effect on the climate and on the German economy.

Also highly worth reading are the comments by various authors on the need for science to reflect on itself and its limits – and on dealing with complexity, truth and uncertainty. Philosopher Sybille Krämer expresses this ambivalence as follows: “Science strives for truth and yet, for this very reason, must disclose every achieved state of knowledge as partially untrue and correctable.” This must be acknowledged and also publicly communicated.

“Humility” as a virtue is experiencing a renaissance – the term is used in an almost inflationary manner in political speeches, but without content. Andreas Voßkuhle, legal scholar and former president of the Federal Constitutional Court, uses it quite differently in his article – intended here as a kind of conclusion: “If this humility were to relativise our inclination to adopt a retrospective know-it-all attitude and strengthen our confidence in dealing rationally with a lack of knowledge, then our political system and our society would have become far more resilient.”

The reviewer

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EMERGING
STRONGER FROM
THE CRISIS

The crisis as an opportunity

Economic policy mistakes and new scope for action

By Stefan Terliesner

Huge aid packages have stabilised the economy during the pandemic. However, much of the damage will likely only start to become visible from 2022 onwards and will have a long-lasting impact. If the right course is charted now, however, companies and society as a whole could trigger a renewal.

Jan Pieter Krahn, scientific director of the Leibniz Institute for Financial Research SAFE and professor of banking and finance at Goethe University, sees the SARS-CoV-2 pandemic from two angles: as “an abrupt interruption of economic activity, that is, as a crisis” and as “a questioning of established production patterns, that is, change”. Provided that entrepreneurs, politicians and also citizens make the right decisions about adapting to a changed environment, the crisis also presents an opportunity. For example, the pandemic has shown the importance of digitalisation.

As a crisis, the pandemic is bringing with it drastic cuts in individual sectors such as aviation, retail, restaurants, hotels and cultural institutions. The plight of those affected is not yet reflected in official statistics. This is due to the suspension of the obligation to file for insolvency in combination with the aid packages. Crifbürgel, providers of information services, estimate that over 300,000 companies in Germany have financial problems. Around 16,500 additional insolvencies can be expected in 2022, they say.

State aid packages have had a stabilising effect

However, the economy is beginning to recover. After gross domestic product (GDP) slumped by 5 per cent in 2020, the German Council of Economic Experts expects growth of 3.1 per cent in 2021. According to the Council, the deciding factor for the further development of the German economy is how the vaccination rollout progresses. If vaccination capacities increase, 70 per cent of adults could be immunised by the end of the summer. Closing industrial businesses should be avoided as far as possible, they say, otherwise economic development will turn out much worse. This is because since the summer

of 2020 the manufacturing sector and export industries have recovered very well. Global supply chains that were abruptly truncated in the spring of 2020 have been quickly restored. Since then, industrial production has been on an upward trend again.

State aid packages have contributed to this stabilisation (see also the diagram on page 70). They are above all compensation for the politically induced decline in demand as a result of the lockdowns. The coronavirus crisis was preceded by six financial years with budget surpluses. According to the Bundesbank (German Federal Bank), with a debt ratio of 59.7 per cent in 2019 Germany was below the reference value of 60 per cent specified in the Maastricht Treaty for the first time since 2002.

Return to the Maastricht Treaty

The Maastricht Treaty agreed between the EU member states in 1992 paved the way for the monetary union, and one of its objectives since 1999 has been to ensure the euro’s stability. Among others, the Treaty demands that states aim for and achieve in the medium term a debt level below 60 per cent of their GDP. In 2020, however, Germany’s national debt shot up by € 27 billion to € 2.3 trillion because of the state aid for private households and companies and plunging tax revenues; this equates to 70 per cent of GDP. The aim now is therefore to reduce debt in order to meet the Maastricht criteria again.

In the mechanical engineering sector, things are on an upward trend again after the crisis thanks to full order books.

IN A NUTSHELL

- Reducing high public debt is indeed possible, as Germany has already proven in the past.
- However, experts demand that with the recovery of the economy after a year of crisis, tax and social policies as well as local government finance ought to be realigned.
- The role of the European Central Bank and its monetary policy need to be discussed again.
- Clear equity capital requirements should be imposed on banks.

That the state is capable of achieving this was shown by its recovery after the economic and financial crisis in 2009 and 2010. At that time, the debt ratio rose to the highest level ever of 82.5 per cent. This shows that the state has already emerged successfully from a huge debt in the past. According to Volker Wieland, professor of monetary economics at Goethe University and member of the German Council of Economic Experts, this could succeed again “if there is a sustained economic recovery”. It might already be possible to adhere to the debt brake again in 2022, he says.



Along with retail, restaurants and hotels as well as the cultural sector, aviation has been hard hit by the crisis.

Save money instead of raising taxes

According to the German Council of Economic Experts, tax increases would be counterproductive because they would lessen economic activity and stifle momentum. Instead, it will be necessary to consolidate public finances as soon as the economy has recovered from the recession, says Wieland. There are two reasons for this: Firstly, it creates room to manoeuvre for stabilising the economy in the event of a large crisis in the future. Secondly, it protects against an overburdening of the welfare state because even now almost one third of the federal budget is being poured into pension insurance as a tax subsidy, which is technically financed exclusively from contributions. Demographic developments will exacerbate this problem even more: In future, fewer and fewer contributors will have to pay the pensions of more and more

older people. In his book “Wie wir unsere Wirtschaft retten” (“How to Save our Economy”), Clemens Fuest, president of the ifo Institute, writes that social policy will have no option but to take a close look at its portfolio and define priorities. The book goes on to say: “Part of sustainable public finance is not neglecting state spending as investment measures, such as for infrastructure or education.” Insofar as such expenditure boosts growth, it could help reduce the debt ratio. Overall, the tax system needs to be more employment- and investment-friendly. Taxes on corporate profits and income are a greater burden on growth than consumption and property taxes, says Fuest.

Tax reforms necessary

According to Fuest, a reform of local government finances, including the abolition and substitution of the trade tax, is also necessary. The coronavirus crisis has shown once again that the trade tax is a bad one because the revenue from it fluctuates considerably in the economic cycle. So far, however, politics has failed to act boldly. Not even in the coronavirus crisis has the federal government been plucky enough to use an instrument to stabilise companies that works very precisely and does not burden the state coffers more than is absolutely necessary: a comprehensive tax loss carryback. Such a loss carryback allows companies to offset losses incurred during the crisis against their profits from previous years. The only thing that was decided was to raise the maximum sum for 2020 and 2021 from € 1 million to € 5 million. Although Alfons Weichenrieder, professor of economics and finance at Goethe University – together with his colleague, tax expert Professor Philipp Lamprecht – welcomed the agreed extension of the loss carryback in July 2020 because it functions in a crisis like an “automatic stabiliser”, analogous to the short-time allowance at the level of blue- and white-collar workers, it is, according to him, inadequately designed. It is bitter that legislation even entirely forbids a loss carryback in the case of trade tax because a company can strengthen its equity base via such a loss carryback. Against this background, tax payments can even drive companies with a functioning business model into insolvency, Fuest also warns, because tax payments are a liquidity outflow. If, at the same time, no money comes in because of the measures implemented in relation to the pandemic, bankruptcy threatens, he adds.

Discussion about the role of the ECB

Not only in Germany does politics use loans and subsidies for affected companies to tackle this threat. The European Union (EU) is also showing solidarity in the area of debt creation. In

February 2021, the Council of the European Union empowered the European Commission for the first time to borrow on the capital market on behalf of the Community. The vehicle for this is the EU Recovery Fund with a volume of up to € 750 billion. The fund still has to be ratified by all member states, which should happen in the summer. While critics consider that the EU is heading for a fiscal union and are complaining that Germany is de facto accepting unlimited liability for all the EU's coronavirus debts, Chancellor Angela Merkel described the EU aid as a one-off action when it was ratified by law by the Bundestag. A pending appeal before the Federal Constitutional Court could still stop the law from becoming effective. What becomes clear at this point is the extent to which the pandemic is shifting the (institutional) balance at European level.

This also applies for the European Central Bank (ECB), whose role and competences are once again a subject of discussion. In normal times, central banks react to a recession by lowering interest rates. The aim is to boost investment and consumption through cheap loans. However, when the coronavirus crisis erupted, the ECB's key interest rate was already at zero per cent. In order to stimulate the economy nonetheless, the ECB approved the Pandemic Emergency Purchase Programme (PEPP), for which – after several top-ups – € 1.85 trillion are now earmarked. The ECB can buy sovereign and corporate bonds for this gigantic sum up until March 2022. Such purchases push down the interest rate on the capital market. France, for example, was able in mid-April to borrow money at zero per cent for ten years, Italy for

0.8 per cent and Germany even at the rate of minus 0.3 per cent.

EU debt has the potential to cause inflation

Quite a few governments have an interest in the ECB continuing to purchase enormous numbers of sovereign bonds because such governments – instead of setting priorities when spending money or tackling reforms – simply take out new loans. Liberal economists such as Wieland and the Kronberger Kreis (the scientific advisory board of the Market Economy Foundation) see in this a conflation of monetary and fiscal policy, although the ECB is independent – or rather should be, according to the Treaty on the Functioning of the European Union. The Kronberger Kreis warns in a study against a “fiscal dominance of monetary policy”. The ECB must present a plan, they say, on how it intends to reduce the high stock of sovereign bonds on its balance sheet.

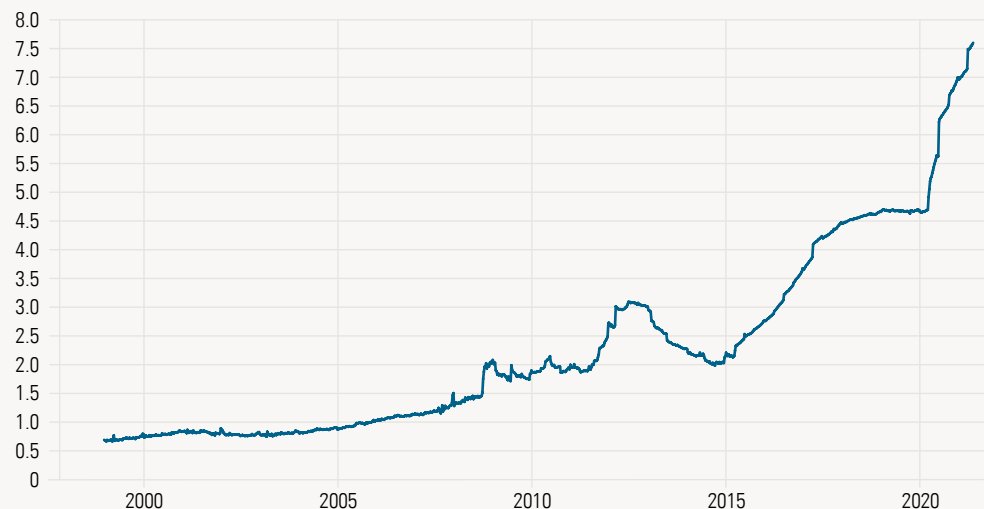
Important to know: The ECB pays for its bond purchases – metaphorically speaking – with money it prints itself. Nowadays, no printers churn out banknotes for this purpose, but instead the ECB credits a corresponding sum to the commercial banks' accounts at the central bank. As a result, the central bank's balance sheet total is rising rapidly and currently stands at around € 7.5 trillion (see diagram below.) The potential to cause inflation is building up here because there is no real production of goods and services behind the “printed money”. Wieland, like Otmar Issing, president of the Center for Financial Studies at Goethe University and former chief economist at the ECB, sees the danger of monetary financing of governments, which is



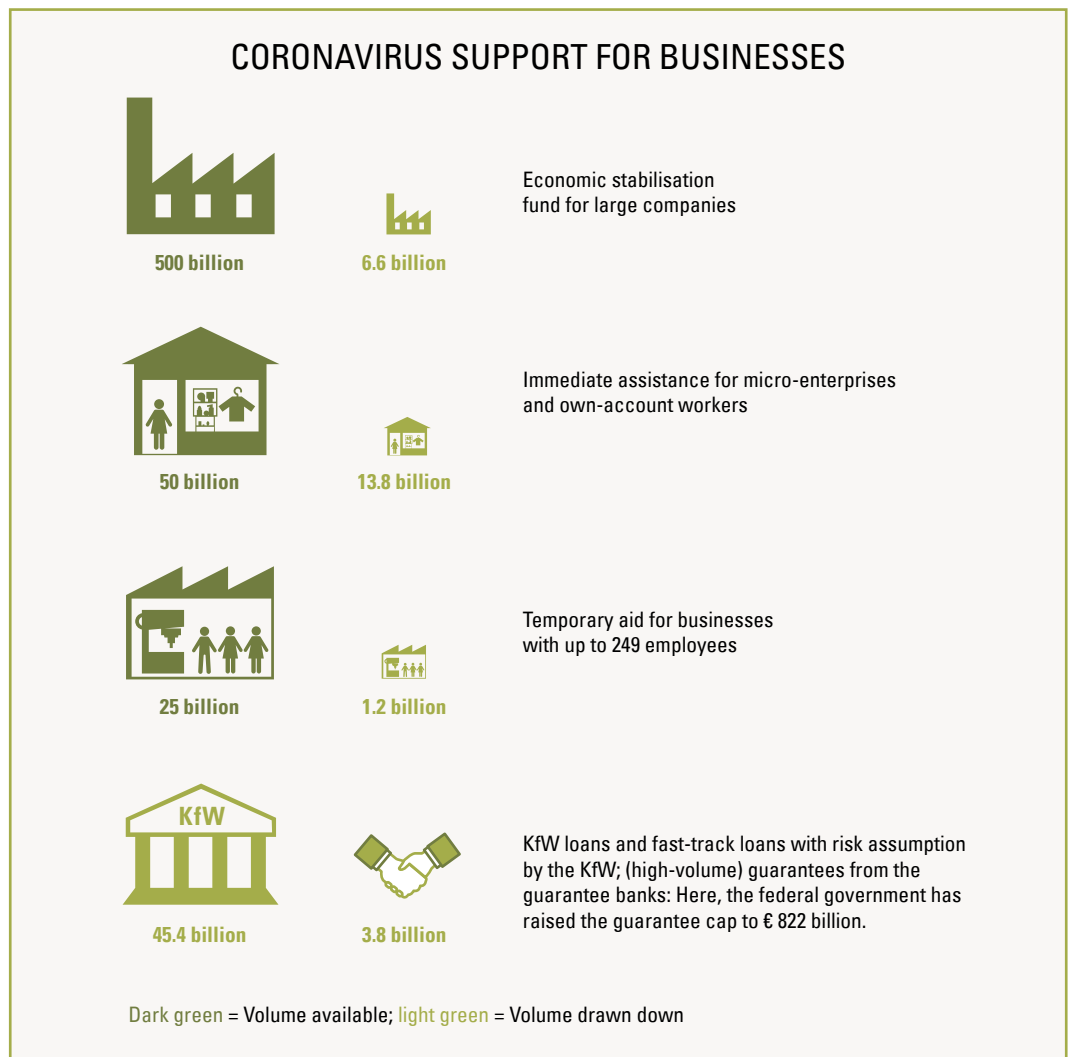
Photo: telesniuk/shutterstock

RISING BALANCE SHEET

ECB balance sheet development since 2000. Figures in trillion euro.



Source: European Central Bank



Source: German Council of Economic Experts – Annual Report 2020/21

forbidden for the ECB. In the pandemic, this route is justifiable for monetary policy reasons. But when the justification for it disappears, then the ECB would have to react, he says.

Savings glut pushes Bitcoin price up

Even without this problem, the greatest danger of a new economic and financial crisis occurring lies perhaps in the ECB's departure from its very relaxed monetary policy. If inflation goes up sharply, the ECB would be obliged to raise the key interest rate because an uncontrolled increase in general price levels is dangerous. Inflation devalues savings and makes it almost impossible for private individuals and businesses to calculate. Germany went through this painful experience during the Weimar Republic. After the First World War, the German economy was in tatters and the state was de facto bankrupt. In order to fulfil its payment obligations nonetheless, the Reichsbank printed money on a massive scale until inflation in Germany exploded. Especially in 1923, the Mark lost value dramatically fast. According to the statistics portal Statista, in November 1923 one US dollar cost around

4.2 trillion Marks. Also worth noting: If the prices of cryptocurrencies such as the Bitcoin are rising sharply at present, this also has to do with the money glut. Andreas Hackethal, professor of personal finance at Goethe University and researcher at the Leibniz Institute for Financial Research SAFE, however, prefers to call this phenomenon a "savings glut" and points out that it is also the reason why share prices are being driven up because citizens forced to save during the lockdown have more money to invest, he says. In his view, the problem is that many new stock market investors "do not invest broadly and calmly according to the textbook, but instead often gamble via trading apps and are taken in by fraudsters promising quick money." This could harm the share culture just awakening in Germany, despite shares being an important element of providing for old age.

Clear equity capital requirements for banks

The phasing out of the COVID-19 aid packages for companies could also become dangerous for the banks. Banking expert Professor Jan Pieter Krahnhen speaks of a "cliff-edge effect" that the



The author

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institutions responsible for banking supervision fear. Without aid packages, an abrupt increase in insolvencies would threaten, he says, which would also have negative consequences for the lending banks. In cooperation with international researchers, SAFE has therefore analysed scenarios for combating banking crises. Krahnert himself is of the opinion that clear equity capital requirements should be imposed on banks, which they must adhere to by whatever means. Behind this is the principle of liability, which by its very nature contributes to responsible business practice. To get banks to show loan defaults in their books in a correct and timely manner, the SAFE research team proposes better credit quality checks and appropriate accounting rules for banks. Without such incentives, unviable companies would receive further financing – something commercial banks tend to do.

Return to realistic balance sheets

Tobias Tröger, professor of private law, commercial and business law and SAFE researcher, is also dealing with risks in the banking sector. And he too criticises the fact that current balance sheets do not mirror the banks' actual solvency status. Ultimately, this endangers financial stability, he says. He recommends that the ECB and the other supervisory authorities use the planned stress test in 2021 to produce a realistic representation of the asset quality of banks in the euro area. This would imply, he adds, "an immediate return to realistic accounting methods in line with the International Financial Reporting Standards (IFRS)." The application of the IFRS 9 standard was attenuated in early 2020 because of the coronavirus crisis. The outcome: Many economic consequences of the pandemic will only become visible from 2022 onwards. Risks are lurking here for financial stability and the ability to finance the welfare state. Other dangers concern the cohesion of society as well as of the EU and the eurozone. At the same time, the pandemic offers an opportunity for restructuring – at the level of companies, states and the EU, for example in digitalisation, education and investments in a self-sustaining recovery. ●



ABOUT

Professor Andreas Hackethal, born in 1971, is professor of finance at the House of Finance of Goethe University, head of "Household Finance" at the Leibniz Institute for Financial Research SAFE, co-director of the Center for Financial Studies and co-director of efl – The Data Science Institute. His empirical research work focuses on the financial decisions of private households, the role of financial consulting and the digitalisation of the financial sector.

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Professor Jan Pieter Krahnert, born in 1954, is professor of banking and finance at the House of Finance of Goethe University and, as scientific director, he is a member of the board of the Leibniz Institute for Financial Research SAFE. His current research is concerned with the causes and effects of the financial crisis, in particular questions of structured finance, systemic risk and a sustainable architecture for the financial markets.

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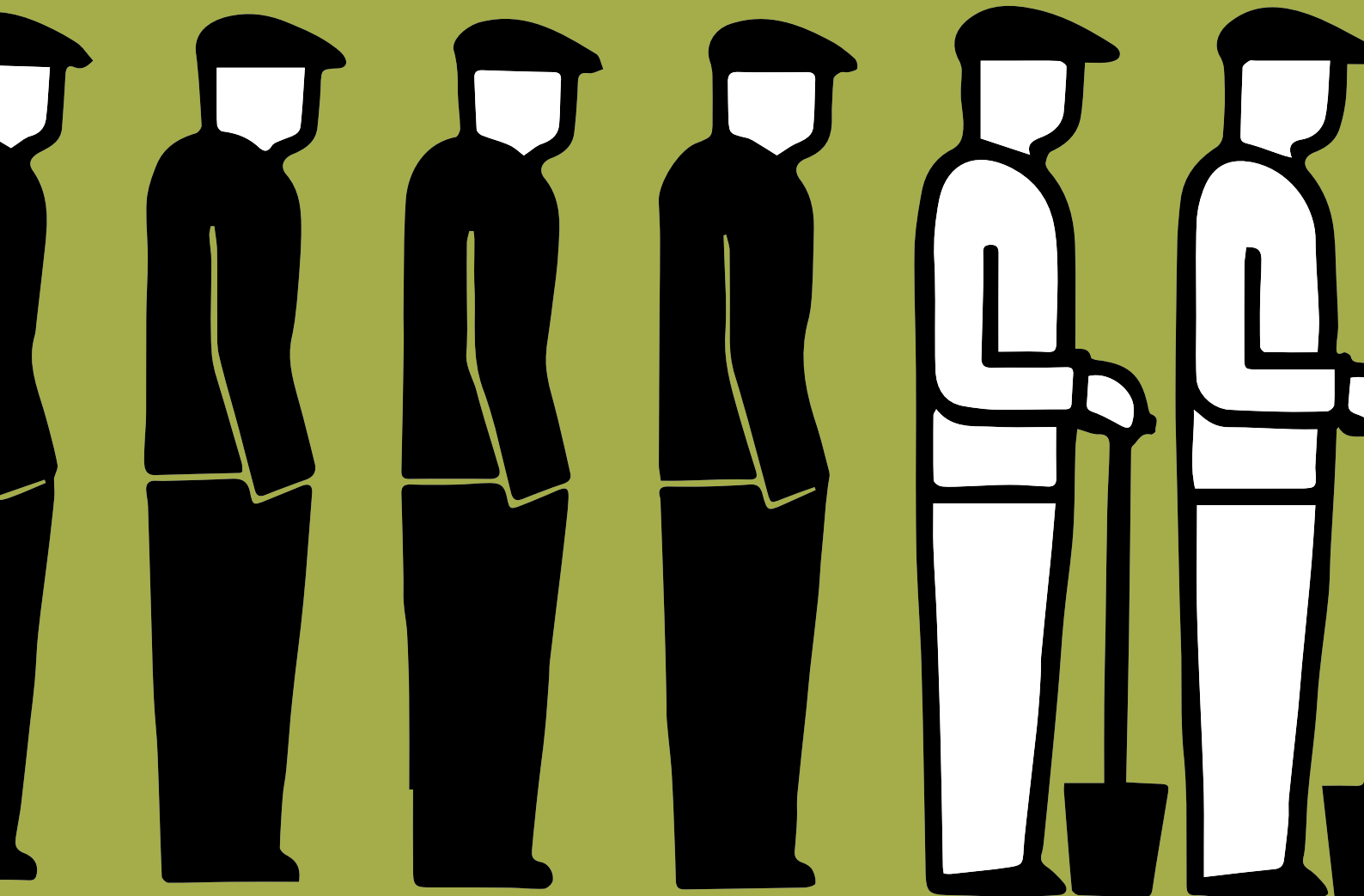
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Learning from crises

Data from the 2008
financial crisis shed light on
the potential consequences
of the pandemic

By Markus Gangl

Economic shocks have substantial consequences for society. High incidence of poverty, unemployment or divorce, lack of educational opportunities, crises of confidence – effective political management may mitigate these consequences and thus contribute to social resilience. What conclusions may be drawn from this for the consequences of the current pandemic?



Societal crises often provide fertile grounds for the social sciences. During the Great Depression of the 1930s, three young Viennese scientists, Marie Jahoda, Paul Lazarsfeld and Hans Zeisel, documented social life in the small town of Marienthal just outside Vienna, shortly after the local textile factory had closed down. Jahoda and her colleagues returned from this assignment with the awareness that work means far more to people than just securing their material livelihood – and founded, not least thanks to their groundbreaking study “Marienthal. The Sociography of an Unemployed Community”, modern empirical social research and social psychology in their later British and American exiles. Over the past years and thanks to generous project funding from the European Research Council, my team and I have had the opportunity to follow the tracks of the Marienthal Study and examine the social consequences of the financial crisis and the subsequent recession in greater detail in an internationally comparative study.

Multi-layered consequences of the crisis

To make the consequences of unemployment visible in people’s lives, we have drawn on representative European and American survey data collected in over 30 countries since the early 2000s. Not surprisingly, we were able to show that the financial crisis led to economic problems. Unemployment represents a major poverty risk for those affected, and even once back in work there is still a high risk of having to accept a job that is lower paid or offers poorer career opportunities. But we have also been able to show that unemployment influences family life, for example because the desire to start a family is put on hold when faced with economic insecurity and because the risk of separation increases. The next generation is also affected because, for instance, a lengthy education or university studies may no longer seem feasible with one or both parents unemployed. Unemployment also has a direct political impact because trust in democratic processes and institutions suffers – not only among those directly affected, but among the population overall.

Whether and to what extent unemployment leads to adverse consequences is much less of an empirical regularity than might be assumed, however. Rather, a lot depends on which resources can be mobilised to resolve an economic crisis. In our project, we have therefore used a broad comparison of European societies and the USA to trace the influence of societal conditions on the impacts of the financial crisis and thus, as it were, to document the societal



Photo: ap/dpa/picture alliance/Süddeutsche Zeitung Photo

prerequisites of resilience. And these can indeed be shown in quite different areas.

Societal instruments for handling crises

In terms of social policy, it is perhaps again least surprising that in the financial crisis, too, the risk of poverty due to unemployment is lower where social security systems are well-developed and offer sufficient income compensation. However, we also see other, partly indirect and secondary effects of labour market, social and education policies: For example, labour market regulation plays an important role in determining whether unemployment leads to longer term wage losses. This is because it influences whether and to what extent employers can adjust individual wages and thus, among others, respond with lower

Banking crisis with worldwide social implications: Many people lost their jobs and had to change their life plans.

Illustration based on a pictogram by Gerd Arntz (1900–1988). Arntz, a socio-critical artist and graphic designer, is regarded as the inventor and pioneer of the modern pictogram.

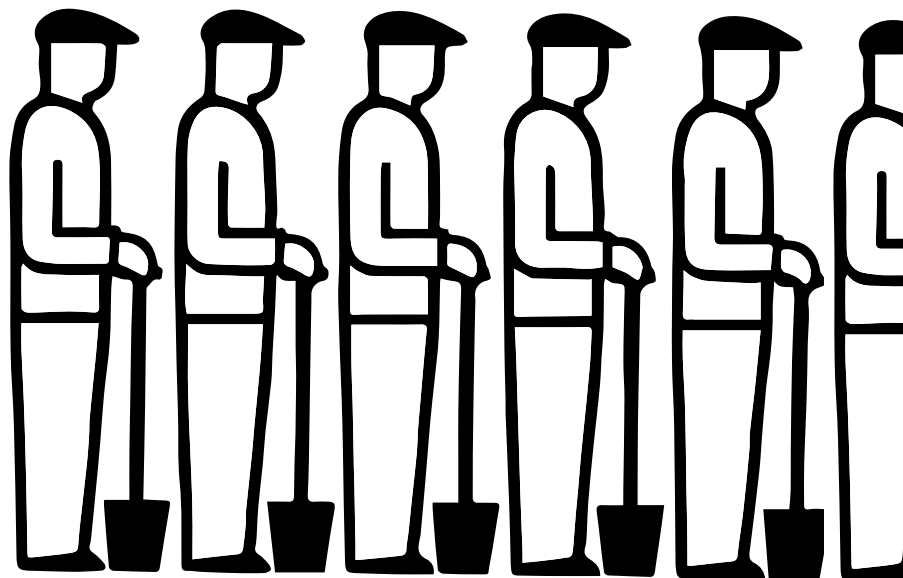




Photo: ap/dpa/picture alliance/Süddeutsche Zeitung Photo/Photo



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Painful learning process:
The Lehman Brothers bankruptcy triggered a global financial crisis, many companies had to give up. In the coronavirus pandemic, comparable unemployment figures did not materialise. A joint economic stimulus package and the European short-time work allowance cushioned many hardships.

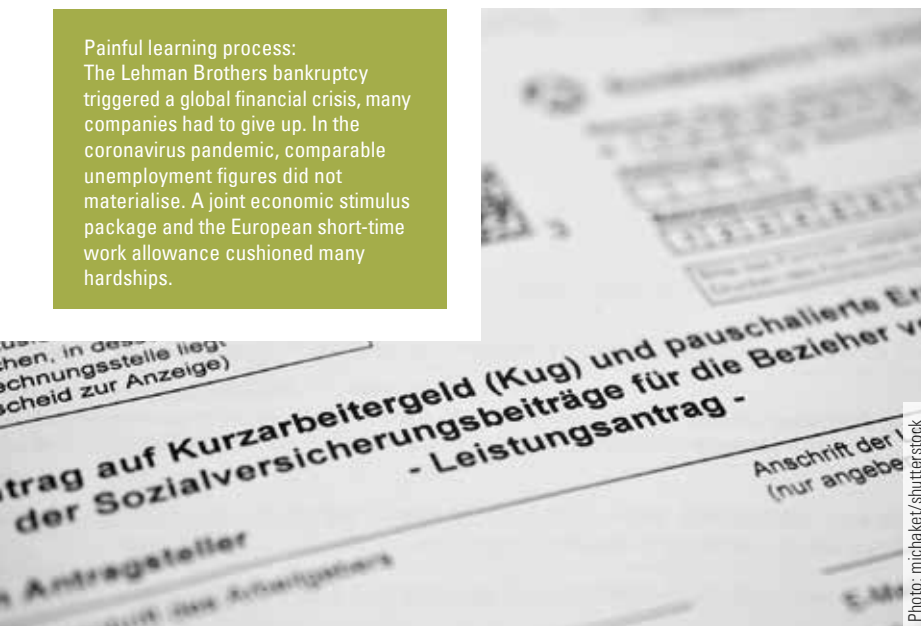


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wage offers when hiring back the unemployed. We were also able to demonstrate that education and social policies can reinforce each other in mitigating adverse consequences of parental unemployment regarding the next generation's educational opportunities: In our study on access to higher education, for example, it can be seen that parental unemployment does not materially affect the educational trajectory of children in precisely those countries where financial barriers to entering higher education are low and generous social security systems are in place.

However, it is by no means the case that all sources of resilience are institutional in nature. Our analyses of the risk of separation and divorce did not show any effect whatsoever from social or labour market policies. Rather, unemployment represents a separation risk especially in those societies where the idea of a male family breadwinner is dominant and much less so in societies with more egalitarian role conceptions. And some of our analyses even point to veritable political paradoxes: We can show, for example, that successful Keynesian macroeconomic management is generally able to prevent a loss of trust in politics. However, we also see that precisely in those countries where social security for the unemployed is particularly generous, their political dissatisfaction is more pronounced.

When attempting to distil a larger picture from our various studies, then the countries that exhibit the highest degree of societal resilience to economic crises are those whose labour market, education, social and public policies have been shaped by long periods of social democratic governance and which therefore are often characterised as social democratic welfare regimes in the social sciences. Germany, incidentally, tends to land in the upper middle ranges in international comparisons, often not far from our Nordic neighbours. On the other hand, in liberal Anglo-Saxon societies and also in Southern Europe, economic crises regularly trigger marked societal repercussions.

Painful lessons from the financial crisis

These results already suggest that although the COVID-19 pandemic is surely affecting everyone, how well the situation can be handled depends on conditions that are very unequally distributed – whether within society, for example between privileged academics who can work from home more or less without further ado and workers whose job at the supermarket checkout, in hospitals, schools or kindergartens, or as care workers inevitably consists of direct interaction with fellow human beings. On a much grander scale, inequalities between the

affluent Western countries and other regions of the world are equally obvious. The latter lack well-developed social security systems and thus the means, for example, to compensate companies and the self-employed for lost income through short-time work programmes and similar measures, to pursue anti-cyclical macroeconomic policies and at the same time to invest massively in vaccine development.

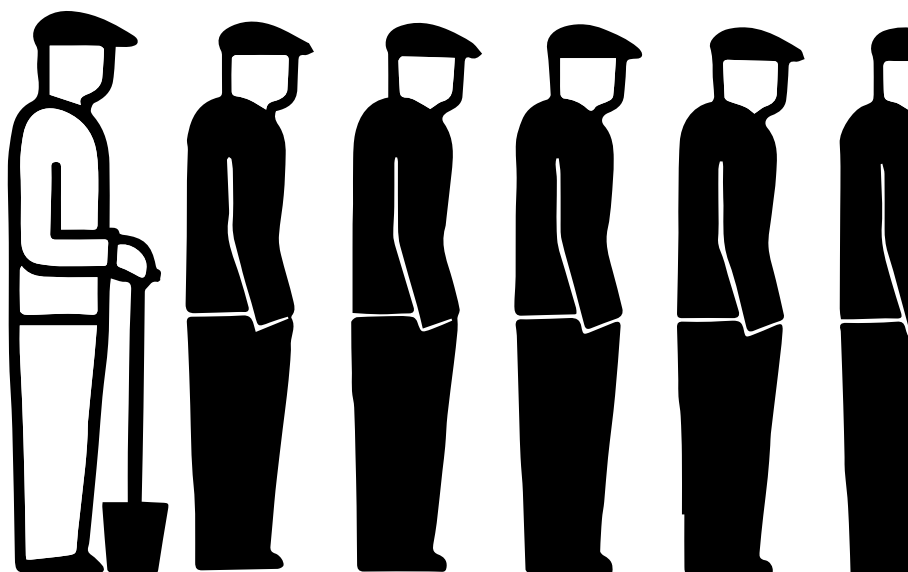
And it is precisely in affluent Western societies that governments are making use of existing institutions and all societal resources that may be marshalled to minimise the economic costs of the COVID-19 pandemic. The economic slump of the past year was at least twice as severe as the one that followed the 2008/2009 financial crisis, yet many countries have so far succeeded in largely decoupling the labour market from it. While the financial crisis had been leading to a labour market crisis that lasted for years in Southern Europe, and while unemployment rates had also significantly increased in many other countries for a long time, most Western societies have so far managed to avoid a similar development this time (see charts). The clear exception in this pattern is the United States, and it does not seem particularly far-fetched to presume that it was precisely this demonstration of political unwillingness that cost Donald Trump his re-election. But in Europe too, we should not underestimate that it is likely not least thanks to the experiences of the financial crisis – and the veritable political long-term crisis of the EU and the euro in view of the omission to a wide extent to take joint action at that time – that we are seeing much more resolute action in the realm of economic policy in the current pandemic than we saw ten years ago. Without the painful learning process from the financial crisis, it is difficult to imagine the shift in the German government's position, which was the game-changer at European level: It suddenly paved the way for a large-scale joint European economic stimulus package and, via the European short-time work allowance, for the first time initiated a substantive European social policy framework.

A critical issue: the young generation

The largely successful macroeconomic management in Germany and many other Western countries has so far brought significantly lower social costs during the current pandemic than earlier experiences from the financial crisis might have suggested. That a very large majority of the population still continues to go along with pandemic-related restrictions after one year speaks volumes about the resilience of society and the value attributed to solidarity and social cohesion.

IN A NUTSHELL

- People who lost their jobs as a result of the 2008/2009 financial crisis were exposed to numerous risks. Many had to take on and remain in lower paid work, went through divorce or separation, children had poorer educational opportunities, trust in democratic processes dwindled.
- Poverty risks due to unemployment were lower where well-developed social security systems were in place.
- Those countries whose labour market, education, social and public policies were shaped by long phases with social democratic governments showed the highest degree of resilience in dealing with economic crises.
- European countries seem to have learned from the painful experiences of the financial crisis: In the current pandemic, they are acting much more resolutely as far as economic and social policy are concerned, and have agreed to fund a joint economic stimulus package and a European short-time work allowance.
- A key issue in economic crises was and is the minimisation of consequential damage for the young generation.



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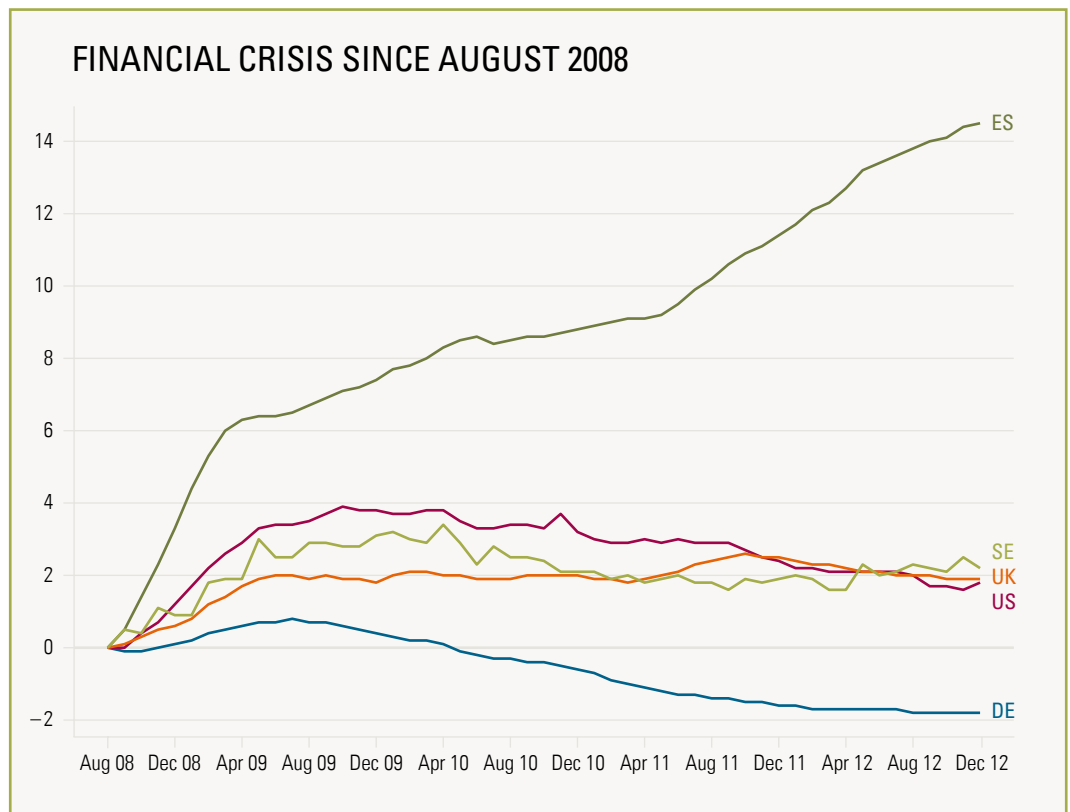
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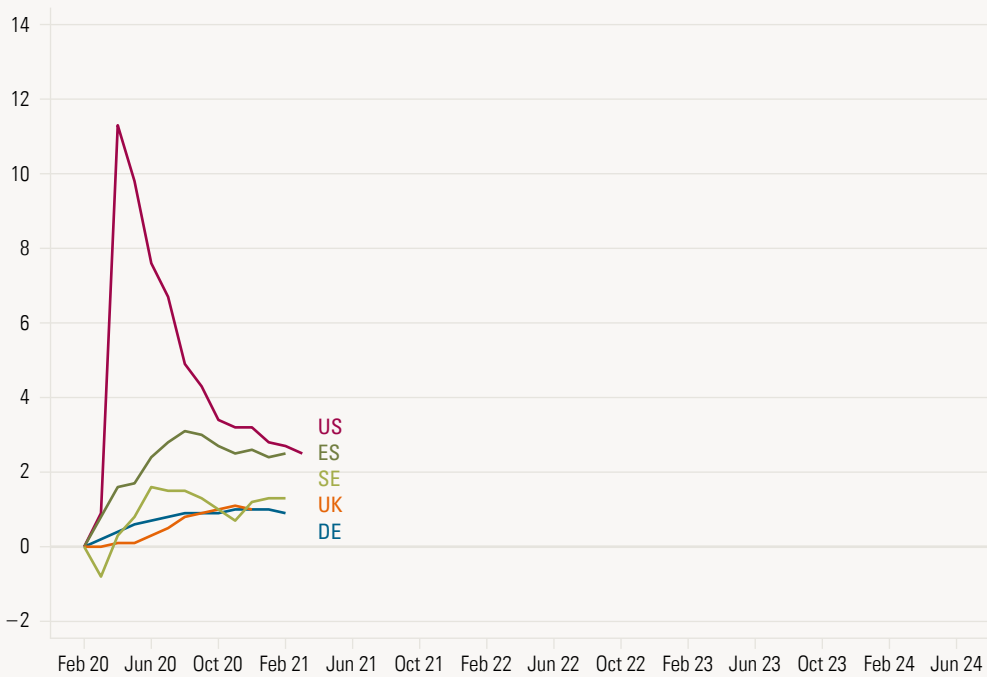
Source: OECD Main Economic Indicators, retrieved on 8 April 2021

Yet even if the accelerating speed of the vaccination rollout gives rise to hope that many restrictions will soon come to an end: But just as with the financial crisis, life will not simply return to a pre-crisis state. After any supply shock, rapid economic recovery is to be expected, including – and especially – in the domain of the cultural and leisure economy. However, the pandemic has laid bare existing inequalities within society because those with adequate social, material and non-material resources at their disposal have been in a better position to master it – as had to be expected. The considerable restrictions placed on school, university and life in other public arenas in order to protect the health of the elderly have demanded a high degree of practical solidarity from young people in particular – and this at a stage in their lives when they are acquiring skills as well as developing and trying out life plans to eventually help shape our society in the future. Focusing on and boosting young people’s confidence about their own prospects – both in terms of educational opportunities at schools and universities and with regard to their subsequent integration in the labour market, which is currently threatened by companies’ reluctance to recruit new staff and offer apprenticeships – will

perhaps be the most important socio-political challenge in coming years.

Incidentally, it is not only the results of our own study but also findings that are already 90 years old that emphasise damage to the younger generation as a critical issue during any economic crisis. One of the most poignant and at the same time most forceful episodes in the Marienthal study concerns the analysis of school essays that Marie Jahoda and her colleagues had asked children to write. The essays revealed that even primary school pupils in Marienthal expressed not only more modest wishes for Christmas but also had more modest career goals than their peers from other towns around Vienna. Jahoda, Lazarsfeld and Zeisel later condensed these and other observations into their much-acclaimed notion of the reduction of mental spaces – and in doing so have given us an important clue from almost a century ago as to why the effective and determined fight against the pandemic and its economic consequences will continue to have an impact for a long time. ●

COVID-19 PANDEMIC SINCE FEBRUARY 2020



Increase in the unemployment rate (in percentage points) from the beginning of the financial crisis and the COVID-19 pandemic



The author

Markus Gangl, born in 1972, has been professor for sociology with a focus on social stratification and social policy at Goethe University since January 2011. He earned his doctoral degree at the University of Mannheim then came to Frankfurt following a period as a post-doctoral researcher at the Berlin Social Science Center (WZB) and professorships at the University of Mannheim and the University of Wisconsin-Madison. At the Faculty of Social Sciences, he is in charge of the CORRODE project, which examines the social consequences of the financial crisis and has been funded by the European Research Council (ERC). In 2019 he secured another ERC project: POLAR is concerned with the significance of growing economic inequality for a liberal society and social cohesion. Gangl is also a member of the German National Academy of Sciences Leopoldina and current editor-in-chief of the European Sociological Review.

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Photo: Thomas Schwappacher / Bundeswehrverband

“We need to rethink the system”

Lessons from the SARS-CoV-2 pandemic for the future of healthcare

By Anja Störiko

Experts from Goethe University and University Hospital Frankfurt agree: Germany has benefited from its healthcare system during the pandemic. However, they see a pressing need to make up ground in some areas, such as the structure of the healthcare system and in digitalisation. Only so can we prepare ourselves for future crises such as climate change.

The pandemic has acted like a microscope, revealing the strengths and weaknesses of our healthcare system,” says Professor Ferdinand Gerlach, director of the Institute of General Practice at Goethe University. The current crisis is a stress test from which we can learn a lot, he says. “Germany has come through the pandemic comparatively well,” emphasises Professor Jürgen Graf, medical director and chairman of the board of University Hospital Frankfurt. Their verdict has been confirmed by figures from international comparisons, for instance a mortality rate that is lower than in many neighbouring countries.

Both agree that Germany has benefited from its structures for outpatient treatment and its regional structures during the pandemic. “The general practitioners here have taken on much of the workload so that the hospitals were not overwhelmed with mild cases, but instead able to provide severe cases with the appropriate care,” says Graf. Over 90 per cent of cases were treated as outpatients. Gerlach adds: “This has also protected us from deadly chains of infection such as that seen in Bergamo, where patients, staff and emergency services in hospitals became hotspots.”

High number of beds failed to help Italy in the crisis

Northern Italy actually had sufficient intensive care beds. However, in the spring of 2020 there was a shortage of nurses, doctors and equipment in Bergamo, and apparently it was easier to transfer intensive care patients from Lom-

bardy to Germany than to the neighbouring province of Veneto – the high number of beds alone was of scarcely any use in the pandemic: “What’s important is quality, i.e. highly efficient hospital structures, and not quantity – lots of beds,” says Gerlach. Nowhere else in Europe are there more intensive care and normal hospital beds than in Germany. Yet at the height of the second wave of the pandemic as many as 150,000 beds were empty. And the very high hospital capacities have their downside: Occupying these beds is a financially attractive proposition. The consequence is more operations than the European average: more than three times as many heart catheter procedures, twice as many hip and knee replacements, as well as tonsillectomies in children – yet by no means better health overall.

In this country, many hospitals are literally obliged to advertise operations in order to recoup the cost of their equipment and beds. This is neither in the interest of patients nor of the healthcare system. “We need to ditch these false incentives and establish quality criteria that are appropriate for health and also in economic terms,” says Graf. “Nowhere else are so many operations performed at so many hospitals!” And each doctor and nurse has to look after more patients than anywhere else in Europe. As a result, Germany is in the top group in a European comparison for per capita expenditure on healthcare: At almost € 5,000 per capita in 2019, it was 40 per cent higher than the EU average.

Many small hospitals perform certain operations only a few times a year. A study two years

Shortage of staff in local health authorities: In many towns and cities, soldiers provided administrative support during the crisis, for example in the area of contact tracing, like here in Frankfurt am Main.



Photo: Aeronautica Militare/Wikimedia Commons

Cervia, Northern Italy, in March 2020: The Italian air force uses special biocontainment beds to transfer gravely ill and highly contagious COVID-19 patients from overcrowded hospitals.

ago by the Bertelsmann Foundation revealed that 40 per cent of hospitals perform operations without adequate expertise. Yet the figures are clear: Only where operations are performed frequently – and a certain minimum number are performed – is optimum care guaranteed. “We have to utilise resources more effectively, shifting from superfluous operations to better care, to a concentration of expertise in centres of competence, and to primary care at local level,” demands Gerlach. “Because this is precisely what the pandemic has shown: Only hospitals with special diagnostic equipment and ventilators, as well as the corresponding specialist staff, were capable of treating the most severe cases, while the overwhelming majority of mildly ill patients received the best possible care locally, without having to utilise expensive technology (let alone make full use of available capacities).”

Specialist hospitals, local care

Both experts are in agreement that the coordination and division of labour in the federal state of Hessen succeeded comparatively well during the crisis thanks to a planning team: Severely ill patients were treated in high-performance specialist hospitals, whereas mildly ill patients were treated close to home. This should be the overall objective of needs-based healthcare, they say: For example, it is a proven fact that heart attack and stroke patients receive better care in specialist hospitals, even if it takes a little longer to transport them there. “Ultimately, patients have to go where care for his or her illness is best – and they also want to go there as a rule,” says Gerlach. Graf adds: “And not every hospital

should offer what it wants to and is supposedly capable of.”

Denmark, for example, has decreased the number of its hospitals accredited for the treatment of heart attacks from more than 50 to about 20 over the past twenty years – since then, heart attack mortality has been halved. In the case of Germany, this would equate to 7,000 avoidable deaths.

Local healthcare providers need to receive greater support

“In the future, we need to be quite clear about who performs which tasks in our health system and when,” says Gerlach. He recommends local healthcare centres comprising larger or networked practices, for example with beds, nursing services and pharmacies, to ensure optimum healthcare at local level. “In addition, general practitioners and hospitals need to work together more closely. It would then be conceivable, for example, for a patient to be transferred from a specialist hospital to a centre closer to home just a few days after an operation, which would make it easier for relatives to visit.” Nursing services could also be better networked at local level, he says, for example through mobile teams. “It would allow us to avoid chains of infection in a pandemic, such as those we experienced in Italy, France and Spain with a centralised healthcare system – and also in the event of multi-resistant germs and flu viruses,” emphasises Gerlach.

Graf calls for the restoration of a balance between demand and needs: “At the moment, the German population goes to the doctor about three times more often than other Europeans. In the A&E departments of our hospitals in

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- The division of labour in Germany between outpatient care and hospitals fundamentally withstood the problems posed by the pandemic.
- In future, tasks in the healthcare system have to be better distributed, for example, through public health measures for prevention, needs-based steering, specialist hospitals and an extensive network of healthcare centres close to people’s homes.
- Advances in digitalisation for optimum healthcare are overdue, including networking of all medical areas, coordinated acute and long-term care, and usable patient data.

April/May last year, we saw what real emergencies are – because contrary to what is usually the case the only patients were those with critical problems.” Local healthcare centres or practices, whose networks also allow for longer opening hours, could take care of everything else, he adds.

“However, in the future we have to give local providers greater support,” emphasises Gerlach. “At the beginning, there was a lack of equipment and concepts for care homes and practices, and later a shortage of tests and vaccinations.” Both experts agree that this requires central coordination.

Revive the public health service

“The many years during which the public health service was neglected have taken their toll; we have bled the local health authorities dry,” says Gerlach. There are around 400 local health authorities in Germany – but also only the same number of medical specialists working in public health. There is also a lack of networking between these authorities, which would be so important if people work in Frankfurt but live somewhere else, for example.

“Although COVID-19 has accelerated a few things in this respect, nothing happened for far too long before that,” says Gerlach. Above all, there is a lack of a superordinate structure: The Federal Health Office was disbanded in 1994 and never replaced. Yet neither the Robert Koch Institute nor the Federal Ministry of Health is responsible for coordinating the local health authorities or has power over them. “We need to fundamentally reposition and strengthen the public health service,” demands Gerlach. In his view, its tasks should also include preventive work, protecting vulnerable groups such as the elderly and people in care homes, organising protective equipment, testing capacities and hygiene concepts, but also precautionary strategies, for example in schools. “At the moment, our healthcare system is reactive: The patient goes to the doctor with a problem. The goal is a preventive system that is also precautionary, inhibits contagion, fosters early detection – our system is not made for this.” And this although such concepts are urgently needed, he adds: Climate change, for example, is endangering health; in 2018 alone, a particularly hot year, 20,000 more people died in Germany from dehydration and heatstroke than in average years.

The public health service has to take on new, central tasks here, says Gerlach. “These include fostering greater appreciation: The public image and remuneration – currently significantly below hospital levels – have to improve vastly. Public health also has to be a topic covered by medical students. At present, for example, pro-

spective physicians are not permitted to complete part of their practical year in a local health authority – Frankfurt is the only exception in this respect. During the pandemic, a large number of medical students helped the local health authorities with their quarantine, testing and immunisation strategies – it is important to build on this momentum.”

More digitalisation: Data help heal

The fact that the local health authorities are poorly equipped for digitalisation is criticised on all sides. A lack of equipment and personnel shortages prevent good networking and tracking, as well as prevention and precautionary structures. “Data help heal!” stresses Gerlach. To date, systematic documentation has scarcely been possible in Germany, which is why, for example, current data on side effects from vaccinations have

German ICUs such as the one here at University Hospital Frankfurt were able to concentrate on treating serious COVID-19 cases during the crisis, since general practitioners took care of most of the mildly ill patients.



Photo: Katrin Bimmer für Universitätsklinikum Frankfurt

POSITION PAPER ON MEDIUM- AND LONG-TERM LESSONS

by Boris Augurzky, Reinhard Busse, Ferdinand Gerlach, Gabriele Meyer

INTERIM REPORT AFTER THE FIRST WAVE OF THE CORONAVIRUS CRISIS IN 2020 (in keywords)

- 1 Public healthcare** as an independent pillar of healthcare: staffing, attractiveness for employees, links to science and primary care and to all policy areas.
- 2 Primary care for outpatients** by general practitioners, coordination and cooperation with hospitals and the public health service: pandemic plans, prevention strategies for old people's and nursing homes, as well as facilities for the disabled, digital networking.
- 3 Specialisation** as well as centralisation, cooperation: clarification at regional level regarding which hospital treats which patients and when. Treat diseases according to guidelines/quality standards as far as possible. "Quality before proximity" principle.
- 4 Integrated healthcare centres:** regional outpatient clinics, nursing services, outpatient operations, emergency care and primary care for inpatients, networked with central standard and maximum care providers.
- 5 Healthcare mandates** govern financing: define capacities based on performance, e.g. beds per specialist department, ventilators, ICU beds, staff. Reserve capacities for crisis cases. New remuneration models.
- 6 Place greater trust in nursing staff,** qualification mix with enhanced skills, e.g. in the event of complex multimorbidity and in order to avoid hospital admissions.
- 7 Digitalisation** of healthcare: exchange of information, also within the EU, linking of databases for better healthcare, coordinated emergency care to direct patients to suitable healthcare facilities. Electronic health record.



The author

Dr Anja Störiko, 56, holds a doctorate in microbiology. She works as a freelance journalist for popular magazines, is the editor of the specialist journal "BIOspektrum" and has written a number of books on health topics. Following the interviews with Professor Gerlach and Professor Graf, she implemented a decision she had been nurturing for a long time and registered for the electronic health record.

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mostly come from abroad, he explains. "Treating physicians and researchers need to have access to data and be able to use these to serve public welfare. Misperceived data protection costs lives. We should not just be worrying about what gets into the wrong hands, but also about important health data not getting into the right hands."

Graf sees less of an obstacle in digitalisation itself, but in the lack of benefits to date: "The technical prerequisites in hospitals and practices have been fulfilled, but data protection is obstructing the smooth exchange of data; there is a lack of incentive to network data because at present nobody benefits from it. Every doctor could immediately cut back on communicating by post and fax if there were a networked digital solution with real added value and without legal hurdles – starting with a patient's medical history, the transmission of diagnoses and X-rays, information on drugs taken, previous interventions, allergies, risk factors, immunisation status, as well as advance directives and living wills."

Call for electronic health record

As an example of this both experts praise the ICU bed register; this, visualises intensive care bed occupancy in Germany on a day-to-day basis and was introduced by the German Inter-

disciplinary Association for Intensive Care and Emergency Medicine (DIVI) when faced with the pressure caused by the crisis. "We can now provide our patients with better care and use existing capacities more efficiently," says Gerlach.

Similarly, he adds, the electronic health record also has to simplify and improve healthcare. "Lots of things would be easier: The record documents blood values, vaccinations, medication, decisions on organ donation, emergency information, allergies – the outcome is more efficient treatments, fewer duplicate examinations, better networking, less paperwork, convenient electronic prescriptions." At present, everyone in Germany who wants to be vaccinated is hunting around for their yellow vaccination card; in the future, there will also be the EU vaccination app – it would be much easier to store all this centrally in the electronic health record, as already long demonstrated by Denmark, Israel and Estonia, for example, says Gerlach. As chairman of the Advisory Council on the Assessment of Developments in the Healthcare System, he recently presented its recommendations on digitalisation in the healthcare sector to the general public: The "Wise Men of Health" advocate that in future every citizen should receive an electronic health record at birth or on arrival in the country, but that they

ABOUT JÜRGEN GRAF AND FERDINAND GERLACH



Professor med. Jürgen Graf

As medical director and chairman of the board, Professor Jürgen Graf, born in 1969, is responsible for the running of University Hospital Frankfurt. He studied medicine in Aachen and London, Canada, and was awarded a post-doctoral degree (Habilitation) in intensive care medicine in Marburg in 2007. After working in a number of hospitals and for Lufthansa's medical service, he became clinical director at Klinikum Stuttgart.

He has been medical director of University Hospital Frankfurt since 2016. As head of the planning team of the Hessian Ministry of Social Affairs and Integration for COVID-19 inpatient care, Jürgen Graf is responsible for coordinating the work of the various parties involved, such as hospitals, general practitioners, health insurers, emergency services and the public health service.

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Professor med. Ferdinand Gerlach

As director of the Institute of General Practice at Goethe University, Professor Ferdinand Gerlach, born in 1961, is responsible for research and teaching in general practice, which above all takes place in about 150 academic teaching practices and some 400 research practices. He studied medicine in Göttingen and public health in Hanover, where he earned his post-doctoral degree (Habilitation) in 1998. He was

appointed as director of the Institute of General Practice at Kiel University Medical Centre in 2001 before moving to Frankfurt in 2004. As chair of the independent Advisory Council on the Assessment of Developments in the Healthcare System, he advises the federal government, the German Bundestag and the German Bundesrat (see www.svr-gesundheit.de).

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should be able to disable it. "This would have tremendous benefits, as the pandemic has again shown – provided that we do not make it as complicated as presently planned, that declarations of consent are necessary before each use and that data can be deleted at any time."

Discussing healthcare

In their next report, the "Wise Men of Health" intend to consider how to prepare for and handle crises: What COVID-19 has now shown, they say, will occupy us more often and for longer in the future, for example due to climate change – the health system has to react to this and be better prepared.

Graf is convinced that "after the federal election, the topics of health and patient care will be discussed more broadly – otherwise we will no longer be as efficient in ten years' time as we are today". This is because welfare funds will then be exhausted, health insurers overburdened, nursing staff scarce, he maintains. "It is our job to make the facts and risks visible and heard – politicians need to get an idea of what is going on and make the corresponding decisions. The facts are on the table; what needs clarifying now is who is going to take responsibility for what volume of patient care and its quality." For this, he says, the government has to create the neces-

sary structures and establish a vision of what can be achieved with our healthcare system. "We need the courage and determination to rethink the system as a whole – that is what experts have to map out, then parliament has to adopt legislation before the federal states develop its final form." What is required, he adds, are incentives, carefully considered governance and quality criteria that reconcile optimum patient welfare with economic efficiency. Graf is convinced: "Our healthcare system is highly capable – we could have the best in the world."

The informed patient

"We have to win people over," stresses Gerlach. He calls for more public relations work and more educational measures with the aim of improving the population's health literacy. Every citizen can contribute here too: "I would like patients to show shared responsibility, ask questions and give thought to rather than passively tolerating what is going on – studies show that this contributes significantly to the healing process." Effective treatment requires not only a functioning healthcare system but also people who support it. ●



Photo: F.A.Z. - Photo/Frank Röth

The Bed Forecast

Data models calculate intensive care bed requirements for the next two weeks

By Andreas Lorenz-Meyer

Since March, regional forecasting models have been predicting intensive care bed occupancy in Hessen's hospitals. This eases the work of those responsible on the ground. And it helps to keep the health system stable – in the current crisis as well as in future ones.

The scenes in Bergamo in Northern Italy back in the spring of 2020 were haunting: A convoy of military trucks transported people who had died of COVID-19 to the crematoria. Today, 15 months later, Bergamo still serves as a cautionary example: Health systems must not be allowed to collapse. To prevent this hap-

pening in Germany, the University Medicine Network has launched the egePan Unimed project. All German university hospitals belong to this network, in the framework of which they aim to pool data, research results, action plans as well as diagnostic and treatment strategies in order to better combat the virus. The egePan Unimed project is one of a total of 13 inter-hospital projects within the network. The objective: optimal, regionally adapted pandemic management. 26 university hospitals and external research institutes are taking part in a total of eight work packages. Work Package 2, in short WP2, comprises the forecasting models. These mathematical models use current incidence figures to forecast intensive care bed occupancy in

a specific region over a period of one to two weeks. How many people there will contract COVID-19? And how many of them will be intensive care patients?

How long do patients remain in the intensive care unit?

Since March 2021, the models have been forecasting bed occupancy in Hessen in relation to the federal state as a whole and the six individual catchment areas. The Executive Department for Medical IT Systems and Digitalisation at University Hospital Frankfurt is responsible for compiling the overall analysis and distributing the forecasts. Michael von Wagner, the department's director, explains why the forecasts are so complicated: "Forecasting models work with assumptions about the future. It's inevitable that these are going to deviate to a greater or lesser degree from what then actually happens in reality." This is because unknown variables always come into play in such assumptions. For example, length of stay. Do patients stay an average of five days in the ICU? Or eight days? Since complications might arise, nobody can say for sure: The patient with weak kidneys suddenly requires dialysis and therefore stays longer – the average promptly increases. The occupancy rate itself is also one of the incalculable factors. If the occupancy rate is 60 per cent, patients are often given a day or two more in order to be on the safe side. Things are different when an ICU is working at the limit – like in Frankfurt around Christmas 2020, when patients even had to be transferred to the north of Hessen. "In such a tense situation, we're no longer so generous when it comes to prolonging stays," says von Wagner. The outcome: The average length of stay shortens.

Computer models from weather forecasting

In order to tackle the problem of these unknown variables, ensemble models are brought into play, like the ones meteorologists also use for

their weather forecasts. Here, the results of several forecasting models, each with its own assumptions, are merged into one overall result. In the case of the WP2 forecasts, the university hospitals in Dresden, Augsburg, Münster and Göttingen as well as the Helmholtz Centre for Infection Research in Braunschweig form the ensemble. IT groups are working there on their own models, feeding them with Hessen's current incidence figures, adding their own assumptions and on this basis calculating a fore-

IN A NUTSHELL

- Having enough intensive care beds for COVID-19 patients was a major concern during the pandemic.
- Mathematical models were developed within the University Medicine Network to forecast intensive care bed occupancy for two weeks.
- The models should help to keep the health system stable during future epidemics too.

cast for each catchment area, with information on the number of occupied beds on normal wards and in ICUs. In the next step, the five individual forecasts are forwarded to the team at University Hospital Frankfurt, which calculates the mean value with standard deviation. "The ensemble model ensures that the forecasts are reliable," says von Wagner: "It levels out the deviations of the individual models and in this way assumptions and reality align more closely."

Intensive care bed occupancy in Offenbach

Anaesthetist Haitham Mutlak, senior consultant at Sana Klinikum Offenbach and a member of its crisis task force, can endorse this. Each Fri-

ABOUT MICHAEL VON WAGNER



Michael von Wagner, 49, has been medical director of the Medical Information Systems and Digitalisation Unit and Chief Medical Informatics Officer at University Hospital Frankfurt since 2019. He was previously medical director of the Central Patient Management Unit and senior consultant for gastroenterology at Medical Clinic 1. Von Wagner studied medicine at Goethe University from 1993 to 2000 and earned his doctorate in 2002. His scientific work has included, among others, the in vivo dynamics of the hepatitis C virus and treatment of chronic hepatitis C.

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day, he receives the 7-day forecast for the Federal State of Hessen and for Catchment Area 4 (Frankfurt-Offenbach). With these data, he can “optimally” control intensive care bed occupancy for the following week because the forecasts are “wonderfully accurate”. This could already be seen shortly after the forecasts started. In mid-March, when the number of infections rose significantly as a result of the Alpha variant, the forecast was: The number of COVID-19 inpatients is increasing, but the number of intensive care patients is more or less constant. And that is what indeed really happened: In Catchment Area 4, only marginally more COVID-19 patients had to go into intensive care than before.



“The forecasts for intensive care beds are wonderfully accurate.”

Dr Haitham Mutlak,
Sana Klinikum Offenbach



The author

Andreas Lorenz-Meyer, born in 1974, lives in the Palatinate and has been working as a freelance journalist for twelve years. His areas of specialisation are sustainability, the climate crisis, renewable energies and digitalisation. He publishes in daily newspapers, specialist journals, university and youth magazines.

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Back then in March, the reason for this was, among others, that most over-80s had already been immunised and were thus protected from suffering a severe progression of the disease. Although there were indeed more infections in the still unvaccinated age group below, that is, the over-50s, “these were cases with a milder progression that needed intensive care far less often,” says Mutlak. The regional forecasts ease the intensive care physician’s work no end. If he knows that the situation in the following week will remain more or less the same, he can allocate available capacities to the various departments “in a fair and transparent way”. On the Monday, for example, general surgery is assigned a place for the tumour patient following her operation, on the Tuesday a bed is reserved for neurosurgery, and so forth. In Mutlak’s view, there are two reasons why the forecasts are reliable.

Firstly, the forecasting models work with regional incidence figures and not with nationwide ones, and secondly, the forecasts relate to just one week. The models are not, however, a substitute for thinking for yourself. Continuing to keep a sharp eye on the local situation is essential. In preparation for the next pandemic, Michael von Wagner, whose unit is responsible for sending the ensemble forecasts to Hessen’s

THE PROCEDURE

The forecasting models for Hessen’s hospitals have been in use since 5 March 2021. Forecasts are produced for the whole of Hessen as well as for the six catchment areas: Kassel, Fulda-Bad Hersfeld, Giessen-Marburg, Frankfurt-Offenbach, Wiesbaden-Limburg and Darmstadt. There are two data sources. First, the number of new infections, which the public health departments collect on a daily basis and transmit centrally to the Hessian State Healthcare Office, which reports to the Hessian Ministry of Social Affairs and Integration (HMSI). Second, ward occupancy, which Hessen’s hospitals have been recording in the IVENA software system since the summer of 2020. The AP2 groups in the egePan Unimed project receive the data from these two sources once a week in an anonymous form and with no possibility to draw conclusions about individual patients. From these data and with their model, they calculate a forecast for each of Hessen’s catchment areas. The individual results then land on the team’s desks at von Wagner’s unit in Frankfurt, who calculate the mean value with standard deviation, compile a graph and send both together to the HMSI in Wiesbaden. The HMSI forwards the overall forecast to the hospitals in Hessen.

hospitals, observes that “COVID-19 has made us conscious of our own vulnerability, but also that of a health system taken for granted.” He considers the intensive care bed as a resource to be something like the bottleneck of general medical care. It has a tremendous influence on public life: If hospital wards become crowded, restrictions have to be imposed: lockdown! The forecasts produced in the framework of egePan Unimed help to keep the health system stable during the crisis. And after COVID-19 too, as von Wagner stresses. “The project is giving us standardised data and reporting channels – this represents fundamental progress.”

Coordinating regional structures are in the process of developing that bring together service providers and state ministries in a “medical context”. These structures still need to be transposed into abstract role models. “Then we can put them into practice rapidly in a new pandemic situation, which hopefully won’t occur too soon, and adapt them to the new challenge.” ●

THE UNIVERSITY MEDICINE NETWORK

In the early summer of 2020, all 34 university hospitals joined forces with the aim of developing new approaches to combat COVID-19. In this context, research, patient care and pandemic management are working together so that findings can be swiftly integrated into practice. The network should also help ensure a faster and more structured response to future epidemiological events. The projects include, for example, inter-hospital emergency admission registers, research on COVID-19 immunity, a Germany-wide autopsy network as well as nationwide standardised, data privacy-compliant infrastructures for storing COVID-19 research datasets and a national strategy for palliative care in times of pandemics. The Federal Ministry of Education and Research will fund the University Medicine Network with up to € 150 million. University Hospital Frankfurt is participating in eight of the current 13 collaborative projects and playing a leading role in three of them. Project leader for the University Medicine Network in Frankfurt is Professor Jürgen Graf, medical director and chairman of the board of University Hospital Frankfurt.

egePan Unimed (Development, testing and implementation of regionally adaptive care structures and processes for evidence-driven pandemic management coordinated by university medicine) is coordinated by the university hospitals in Frankfurt and Dresden and implemented in cooperation with 26 other university hospitals and external institutions. The project brings together experiences from regional, national and international pandemic management concepts on a sound scientific basis to create a prototypical model. The aim is to safeguard inpatient and outpatient care capacities by dovetailing a large number of system components.

NAPKON (National Pandemic Cohort Network) is a network of key infrastructures and cohort platforms aimed at forming a basis for understanding and combating COVID-19 and future pandemics. NAPKON takes care of the overall collection and use of clinical data and biospecimens and in so doing can draw on the preliminary work on the "German Corona Consensus Data Set" (GECCO). The project delivers a thorough documentation of data on preventive, diagnostic and therapeutic measures, including detailed information on current risk factors and potential biomarkers for disease progression – and can ultimately support the development of vaccines and effective therapeutics. Professor Janne Vehreschild from Medical Clinic 2 at University Hospital Frankfurt is the spokesperson for the project, which is jointly coordinated by five university hospitals.

RACoon (Radiological Cooperative Network) is the first project on this scale worldwide to set up a nationwide infrastructure for a systematically structured documentation of radiological data from COVID-19 cases. Radiological data make it possible to recognise, assess and track pulmonary infections triggered by a pandemic. Traditionally, results are entered as free text and are therefore unsuitable for automatic, machine-based evaluation. The structured recording method applied in the RACoon project forms the groundwork for processing large numbers of radiological results in real time. The aim is to use the highly structured data to assess situations and as an early warning system and to provide science with insights into the disease's mechanisms of action as well as into risk factors and therapies. RACoon is headed by Professor Thomas Vogl, director of the Institute for Diagnostic and Interventional Radiology at University Hospital Frankfurt, together with colleagues from Charité in Berlin.

CEO-sys (COVID-19 Evidence Ecosystem for the Improvement of Knowledge Management and Translation) will identify, process and analyse data and scientific publications on the COVID-19 pandemic. 21 universities and four external partners are contributing, including the Institute of Medical Microbiology and Hospital Hygiene in Frankfurt headed by Professor Volkhard Kempf. This will lead to the development of a dynamic, evidence-driven ecosystem that will offer the possibility to base therapy, care strategy and political decisions on the best current evidence available. Especially hygiene-related aspects, such as the emergence of bacterial superinfections which complicate patient care, are to be analysed in this context.

Projects involving University Hospital Frankfurt: The "B-FAST" project is a nationwide research network in the field of applied surveillance and testing. "COVIM" is concerned with establishing and making use of SARS-CoV-2 immunity. "DEFEAT PANDEMIcs" is building up a nationwide autopsy network for pandemics, and "CODEX" is setting up a research data platform to make data on COVID-19 available in a standardised format.

www.netzwerk-universitaetsmedizin.de



“Neither the devil’s work nor a promise of salvation”

Experience with digital learning in distance teaching will change school education

By Katja Irle

The pandemic is showing learners and teachers alike the limitations of digital teaching and the importance of social relationships. However, the crisis is also revealing the advantages of distance learning. If used cleverly, digital delivery can be a driver of innovation in schools.

A future scenario: Mila (15) can sleep longer today. The teenager no longer has to struggle out of bed at 6:30 every morning in order to arrive punctually at school. She did some work in advance yesterday and uploaded the solutions to her maths tasks onto the school's portal late in the evening. The feedback appointment with the teacher is not scheduled until 11:00 in the virtual timetable. Until then, Mila can take it easy.

What is still considered a pleasant side effect of coronavirus-induced distance learning could soon be part of a new learning culture. "I'd like to continue learning as it suits me after the pandemic too and not be so dependent on the fixed timetable at school," says 17-year-old Tom. That could mean: With the help of online learning systems, he could make faster progress in his favourite subjects. In subjects where he still has some gaps, he would be given additional tasks to meet his individual needs. The new flexibility through online learning would not only accommodate his personal biorhythm. Even if a teacher falls ill, the lesson would not have to be cancelled entirely, as is often the case when there is a shortage of teachers.

Communicating complex material better

"Lots of new possibilities are opening up at the moment that are changing learning," says Kai Maaz, education researcher and executive director of the DIPF Leibniz Institute for Research and Information in Education. For him, digitalisation in schools is "neither the devil's work nor a promise of salvation." However, especially with regard to computer simulations of complex material, for example in the natural sciences, he sees great opportunities through new technologies. Another field he mentions is adaptive digital learning, where intelligent learning systems

adapt learning content to individual students' personal needs. This could assist teachers in their own diagnosis of children's strengths and weaknesses and help them to provide individual learning support, he says.

How is the individual school student progressing? Do they repeat the same mistakes? What is the learner particularly good at? What additional material is needed? These are important questions along the path to personalised learning. In education, this is, in fact, old hat – of course teachers know that each child should be seen with his or her individual strengths and weaknesses. However, due to time constraints in everyday teaching this is rarely feasible. Whether teachers' diagnostic expertise is fundamentally superior to the algorithms of learning programmes should also be questioned – or whether good interaction between humans and machines might not result in a better learning plan.

Tools such as the Bettermarks online learning system, which a large number of schools are using for maths teaching especially during the pandemic, deliver feedback on performance levels to both the students and the teachers. The digital maths teacher recognises mistakes and gives the children guidance. If an answer is incorrect, the system presents solutions and helps the children to look things up. Teachers, in turn, can adapt the range of tasks for their classes, ideally even for each individual student. Even if, as experts say, such digital systems are not yet sufficiently capable of communicating new knowledge well, they could at least expand on what has already been learned and in so doing relieve the respective teacher's workload. They could even help to compensate for deficits, foster strengths and thus see to more educational equity.

More flexible learning: For adolescents in particular, a pleasant side effect of distance learning was that they could organise their day more freely.

“School without face-to-face classes does not work”

So far the theory. “In practice, unfortunately, we’re still a long way from making optimum use of digital alternatives,” says Kai Maaz. To date, he has experienced teaching during the crisis mainly as the “digitalisation of analogue material.” Above all parents know what he means by this: From incomprehensible work assignments with links that lead to nowhere and poor, homemade learning videos to photographs of textbooks and being told to print out 20 pages of them – all this can be found on schools’ learning platforms.

However, even if teachers are experienced in digital teaching, the pandemic is showing that not all children benefit from it. Initial studies confirm that children who are already disadvantaged are left further behind because they do not have the necessary hardware or support from their families, and they need personal contact to their teacher. Technology cannot replace real contact between teachers and students. Of this Kai Maaz is also convinced: “The crisis is

showing that school without face-to-face classes does not work. That’s why teachers will continue to occupy a key position in future.”

The younger the children, the more this holds true. When Diemut Kucharz, educational scientist and professor of primary school education at Goethe University, looks at distance learning, she sees that the limitations have become obvious: “Children need personal relationships and guidance. In the case of primary school children, you first of all have to awaken their interests.” Sounds logical. After all, textual material cannot help a child who is learning to read and write – nor can explanations via video. Kucharz is convinced that the ability to communicate and learn educational language is also coupled with direct contact to the teacher. “Facial expressions and gestures play a major role in storytelling and reading out loud. They cannot be substituted by computer programmes.” Empirical studies also reveal, she says, that the teacher’s personality and attention are central to learning: “Children want to form a relationship with their teachers – in real life, not via a monitor.”

IN A NUTSHELL

- The school closures during the pandemic drew attention to the possibilities of digital schooling – in future too. Education researcher Kai Maaz sees tremendous opportunities for teaching complex contexts and for individual learning.
- The crucial factor is the interaction of humans and machines: Algorithms could relieve teachers’ workload, but not simply replace them.
- The younger the children, the more important the teacher: Learning in primary school has a lot to do with building relationships, stresses Diemut Kucharz, professor of primary education. Nevertheless, digitalisation presents opportunities here too.
- So far, there has been too little digital training for teachers in Germany, which has proved negative especially in the emergency situation of the pandemic. Professor Holger Horz’s “Digi_Gap” project aims to close such gaps.
- Educational scientist Professor Merle Hummrich warns against underestimating the importance of school as a place for socialisation.
- Distance learning in the pandemic has widened the social gap even further.

Primary school: subject didactics in demand

Professor Kucharz is anything but an opponent of digitalisation. She also sees potential for learning at primary school level in future, for example in computer-aided learning progress assessment, as is currently being tested with the “quop” programme, among others at primary schools in Hessen (www.quop.de). At the heart of quop are tests in reading and mathematics, which are based on the educational standards prescribed for each school year. Digitalisation can also help if material that has already been learnt needs to be cemented again and again by practising – for example spelling or arithmetic, says Kucharz. Here, digital programmes could supplement or even supersede the paper workbooks commonly used until now – with the advantage that children would receive immediate feedback and therefore be more motivated, she adds. For university teachers, their experience with digitalisation during the pandemic has by all means had positive effects: “A few years ago, my student teachers still had enormous reservations about digitalisation in primary schools. Now in the pandemic, it’s like a dam is breaking.” Nonetheless, she assumes that digital learning in primary school teaching is still viewed more critically than elsewhere: “It’s not enough to bring the software developers on board, subject didactics specialists are also called for.”

Quality of digital teaching left to chance

The cultural battle of “digital versus analogue”, as has been fought out especially in education

for years, seems to be giving way to the realisation that the future of learning is “digital *and* analogue”. For this to succeed, schools not only need better technical equipment. Training and continuing education for teachers must change as well. Even before the pandemic, studies showed that teachers lack digital skills. For example, a special analysis of the 2018 PISA Study revealed that there are not enough opportunities for continuing education for teachers in Germany. This has a number of implications: According to the analysis, less than 44 per cent of headmasters and headmistresses consider their teachers proficient enough to use new technologies for effective teaching. In the worst-case scenario, this means poor teaching despite good technology.

In distance learning, these shortcomings are now becoming obvious. It is often left to chance whether children are taught reliably and competently or fall behind at home. While one teacher holds video conferences on a regular basis and delivers feedback via the learning portal, the other only uses worksheets in their teaching because he or she lacks the technology or know-how – or both.

With the “Digi_Gap” project in the framework of the “Qualitäts Offensive Lehrerbildung (QLB)”, a campaign for quality in teacher education, Goethe University had already set out to close such gaps even before the coronavirus crisis. Work is being done on interdisciplinary training and continuing education formats. On the one hand, student teachers learn how to



Photo: Nina Ludwig



Photo: Stephan Rumpf/Süddeutsche Zeitung

The classrooms remained empty, but online connections overheated. Even younger school students had to get to grips with virtual lessons and the interweaving of the two worlds.



Photo: Nina Ludwig

Under certain circumstances, school could become a social event even in distance learning, like here in the open air in Bockenheim.

handle selected digital technologies in a practice-oriented way. On the other hand, they need to understand when using a whiteboard is an effective teaching method and when it is not.

Individual performance assessment instead of class work?

Particularly during the months of the pandemic, Professor Holger Horz, executive director of the Academy for Education Research and Teacher Education and the project's scientific director, is receiving positive feedback from young teachers who have "practised" with "Digi_Gap" at the university: "They say: This came to our rescue in distance teaching." He is convinced that the trend towards digitalisation will be unstoppable after the coronavirus crisis. He too sees potential, for example in individual support for school students, adaptive learning and learning assessments. Horz, professor for the psychology of learning, even predicts that individual performance assessments will catch on in place of class tests: "Alternative assessment methods are putting the current grading system increasingly into question." In addition, distance learning has drawn our attention once again to the lone wolf existence of many teachers: "We've seen that the closed-door policy is a big disadvantage and understood that we need networking and cooperation instead. That will have an impact."

In educational science, however, not everyone is singing the praises of digitalisation. In the framework of the VERSA project and with the help of case studies, Goethe University professors Barbara Asbrand, Merle Hummrich and

Mirja Silkenbeumer are examining the changes brought about by distance schooling. It is not just a matter of not enough mobile devices, unstable internet and didactic problems. They are investigating how social and student-teacher relationships are changing because at present these are being overlooked. "During the pandemic, the focus is above all on the cognitive and technical level," says Merle Hummrich, "What appears to be particularly important is which tools make for efficient teaching." School, however, is an interactive social affair. In her view, school as a place for socialisation is being questioned right now. The result: "Responsibility is shifted towards the parental home." Especially for older school students, autonomy processes are "frozen", and important exchange in peer groups is interrupted, she says. In the framework of VERSA, Hummrich and her colleagues are looking at the impact: Will social interaction in learning groups be the same after the crisis as it was before? Will rituals that structure the school day stay in place? Do school students change when they are only connected to each other and the teacher via digital formats? If gestures and facial expressions are reduced to a minimum?

When it comes to educational equity, it is already evident that coronavirus-induced distance learning tends to make existing ills even worse. Studies such as the "School Barometer" of the Institute for the Management and Economics of Education (IBB) at the University of Teacher Education Zug in Switzerland show a distinct "scissor effect": Children from privileged families mostly do well, while their disadvantaged peers fall further behind. That is why Merle Hummrich is very sceptical whether digitalisation – for example in the areas of personalised learning and performance feedback – can help to make education "more equitable" in future. This would mean schools stepping back from their responsibility to teach children something, she says: "If individual pupils can't cope then, it's their own fault and not the school's." ●



The author

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Laboratory recipes for SARS-CoV-2 proteins

For the development of drugs or vaccines against COVID-19, research needs virus proteins in high purity. For most of the SARS-CoV-2 proteins, scientists at Goethe University Frankfurt and 36 partner laboratories have now developed protocols that facilitate the production of several milligrams of each of these proteins in high purity and make it possible to determine the three-dimensional protein structures.

compounds bind to viral proteins. This is done at the Biomolecular Magnetic Resonance Centre (BMRZ), among others. However, the basic prerequisite is the production of large quantities of the proteins with high purity and stability, and with their correct folding, for the large number of tests.

The network, coordinated by Professor Harald Schwalbe from the Institute for Organic Chemistry and Chemical Biology at



Dr Martin Hengesbach (left) and Dr Andreas Schlundt, NMR scientists from Goethe University, at the nuclear magnetic resonance spectrometer.

The laboratory protocols and the required genetic tools are freely accessible to researchers throughout the world, who as a result can work in a fast and reproducible way on SARS-CoV-2 proteins as well as on the mutations that will emerge in the future. Researchers at Goethe University and TU Darmstadt already began networking at international level at the very start of the pandemic.

Their goal: to describe the three-dimensional structures of SARS-CoV-2 molecules by means of nuclear magnetic resonance spectroscopy (NMR). In NMR spectroscopy, molecules are first labelled with special types of atoms (isotopes) and then exposed to a strong magnetic field. NMR is then used to look in detail, even with high throughput, at how potential active

Goethe University, was already able to make all important RNA fragments of SARS-CoV-2 accessible in 2020. With the expertise of 129 colleagues, they have now succeeded in producing 23 of the around 30 proteins of SARS-CoV-2 completely or in important parts "in the test tube". The research work continues to be funded by the German Research Foundation and the Goethe Coronavirus Fund. The high logistical effort and ongoing exchange of research results was supported by Signals, a spin-off company of Goethe University.

<https://www.tinygu.de/sarsproteins>

"University Teacher of the Year"

The two university teachers Professor Sandra Ciesek and Professor Christian Drosten have been awarded the title "University Teacher of the Year" by the German Association of University Professors and Lecturers (DHV) for their services as "explainers" of the coronavirus. This is the first time that the title has been awarded to two people.

In February 2020, at the start of the coronavirus pandemic, Norddeutscher Rundfunk, a German broadcasting company, launched the podcast "Coronavirus Update" in response to the public's considerable need for information on everything to do with SARS-CoV-2. The podcast takes a scientific approach to various aspects of the pandemic and delivers updates on ongoing research work and assessment of the current situation. Since the end of August 2020, Professor Sandra Ciesek, director of the Institute of Medical Virology in Frankfurt, has been a regular guest, alternating each week with Professor Christian Drosten, head of the Institute of Virology at Charité in Berlin. The association's justification for the award is that the two virologists present scientific findings in a competent and easily understandable way in their podcast and their weekly contributions on coronavirus research strengthen society's trust in science in times of crisis. The association praised Sandra Ciesek's and Christian Drosten's courage and consistency in stepping out of their scientific environment and sharing the "research adventure" with a broad public. In so doing, the association said, they had chosen a path that also brought them criticism yet had nonetheless remained committed to the search for truth and factual information.

<https://tinygu.de/Hochschulverband> (in German language)

Gestures, facial expressions, images: visual communication in focus

Speaking, writing, reading, listening – these are not the only channels of human communication. But what possibilities are there for conveying information outside spoken language? And how do they work? These are questions which a new priority programme funded by the German Research Foundation will address. The “Visual Communication” (ViCom) project is one of 13 new priority programmes that will be able to start their research work in 2022. The application for the collaborative project was submitted by Professor Cornelia Ebert (Goethe University) and Professor Markus Steinbach (University of Göttingen), both linguists. Goethe University heads the alliance.

The project centres on extra-linguistic channels of communication, such as gestures, facial expressions and images. The two researchers are looking at the topic from different perspectives: While Markus Steinbach is primarily studying gestures, Frankfurt semanticist Cornelia Ebert is focusing on the gestural extension of communication. School and education as well as therapeutic communication, gestural communication between animals and human-computer interaction are further topics that will play



Language is not everything in communication – many things are also visual. The “ViCom” project is exploring this.

a role in the collaborative project at the two universities.

The interest in visual components of communication is relatively new in linguistics, the focus otherwise lying more strongly on spoken language. Other areas of cultural studies and the humanities are already dealing with visual phenomena in communi-

cation – for example in film studies, psychology or computer science. The purpose of the priority programme is to bring these perspectives together in order to jointly develop a new communication model that can capture the peculiarities and complexity of multimodal communication. The programme should also help to advance methodological, technological, therapeutic and didactic innovations in this field.

Overall, the Senate of the German Research Foundation was able to select from among 47 proposals from all scientific disciplines. The 13 successful priority programmes, among them the Frankfurt-Göttingen programme, will together receive a total of around € 82 million for an initial three years.

Cornelia Ebert has been a researcher and lecturer at Goethe University since 2019, primarily in the field of semantics. She studied computational linguistics in Potsdam and came to Frankfurt after several academic posts elsewhere. In 2020, she was awarded a Goethe Fellowship at the Forschungskolleg Humanwissenschaften in Bad Homburg.

<https://vicom.info>

Second mechanism of action of remdesivir

When a cell is infected, SARS-CoV-2 not only causes the host cell to produce new virus particles. The virus also suppresses host cell defence mechanisms. The viral protein nsP3 plays a key role here. By means of structural analyses, researchers at Goethe University, in cooperation with the Paul Scherrer Institute in Switzerland, have now discovered that a degradation product (GS-441524) of the virostatic agent remdesivir binds to nsP3. This points to a further, previously unknown mechanism of action of remdesivir that might be important for the development of new drugs against SARS-CoV-2 and other RNA viruses.

Professor Stefan Knapp from the Institute of Pharmaceutical Chemistry explains: “Our structural analyses are laying important groundwork for the development of new and more potent antiviral drugs, also against alphaviruses such as the chikungunya virus.”

<https://www.tinygu.de/remdesivir>

Remote learning – same effect as summer holidays

How effectively do children and teenagers learn in remote classes? A study by the Department of Educational Psychology at Goethe University delivers a sobering answer – at least for the spring of 2020: Learning progress not only advanced more slowly due to the coronavirus-induced school closures but even went into reverse – like after six weeks of summer holidays.

Despite efforts to continue school operations as far as possible with the help of remote learning and digital formats, enormous learning deficits have emerged, says lead investigator Professor Andreas Frey. With the help of scientific databases, he says, studies have been identified that have calculated the effects of school closures on performance and skills. According to the review, such learning deficits are particularly pronounced among school students from socially disadvantaged households.

<https://www.tinygu.de/remotetelearning>

Melting ice due to iodine particles over the Arctic

When sea ice melts and the water surface area increases, more vapours containing iodine rise from the sea. Scientists from CLOUD, an international research alliance, rapidly form from such iodine vapours, which can serve as condensation nuclei for cloud formation.

They fear a mutual intensification of sea ice melt and cloud formation – a vicious circle that could accelerate the warming of the Arctic and Antarctic. CLOUD member Professor Joachim Curtius from the Institute of Atmospheric and Environmental Sciences says: “The mechanism we’ve found can now be integrated in climate models because iodine possibly plays a dominant role in aerosol formation, above all in the polar regions, and this could improve climate model predictions for these regions.”

<https://www.tinygu.de/iodine>

How the 3D structure of eye lens proteins is formed

The lens of the human eye gets its transparency and refractive power from certain proteins being densely packed in its cells. These are mainly crystallins. If this dense packing is not preserved, for example due to hereditary mutations in the crystallins, the result is lens opacities, known as cataracts, which are the most common cause of vision loss worldwide.

For crystallins to be densely packed in the lens fibre cells, the proteins must be folded correctly in three dimensions. For the correct folding of the protein gamma-B crystallin, certain bonds form, among others between individual amino acids of the protein, which are known as disulphide bridges. Contrary to previous assumptions, such disulphide bridges already form in parallel to the synthesis of the protein in the cell, as scientists from Goethe University, the Max Planck Institute of Biophysics in Frankfurt and the Institut de Biologie Structurale in Grenoble, France, have discovered.

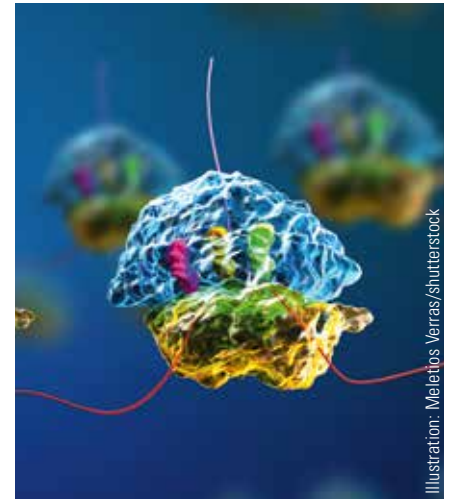
Producing such disulphide bridges is not quite so easy for the cell, since biochemical conditions prevail in the cellular milieu that prevent or dissolve them. That is why, in the finished gamma-B crystallin protein, the disulphide bridges are shielded from the out-

side by other parts of the protein. During formation, a protected area of the protein synthesis complex, the ribosomal tunnel, takes over this function, as the German-French research team has discovered.

“We were able to show that the ribosomal tunnel provides sufficient space and shields the disulphide bridges against the cellular milieu,” says Professor Harald Schwalbe from the Institute for Organic Chemistry and Chemical Biology at Goethe University. “Surprisingly, however, these are not the same disulphide bridges that are later present in the finished gamma-B crystallin. We conclude that at least some of the disulphide bridges are later dissolved again and then bond differently. The reason for this probably lies in the optimum timing of protein production: The ‘preliminary’ disulphide bridges accelerate the formation of the ‘final’ disulphide bridges when the gamma-B crystallin is released from the ribosome.”

The researchers now want to test, in the framework of further studies, whether the synthesis processes in the slightly different ribosomes of higher cells are similar to those in the bacterial model system.

<https://www.tinygu.de/eyelens>



In the cell, ribosomes (blue/yellow) migrate along the mRNA (red “thread”) and produce proteins, indicated here as purple threads.

Illustration: Meletios Verras/shutterstock

Research Training Group “Configurations of Film” of the German Research Foundation can continue its work

What happens when film leaves the cinema and becomes available everywhere – out and about on mobile devices, or at home in the living room? The Research Training Group “Configurations of Film” at Goethe University has been researching the current transformation of film and cinema culture since 2017. The German Research Foundation has now given the project the green light to continue.

“We are very pleased that the German Research Foundation is continuing to place its trust in us and that we can continue our productive work in the RTG,” says Vinzenz Hediger, professor of film studies and the RTG’s spokesperson. In the framework of individual studies, in which researchers from philosophy, literary studies and theatre studies are also participating, the Research Training Group is examining a fundamental problem of film studies: the transformation of its objects through the progressive digitalisation of the production, distribution and perception of moving images.



How are Netflix and Co. changing the objects of film studies?

The Research Training Group at the Department of Theatre, Film and Media Studies started in 2017 with twelve doctoral candidates and two post-doctoral researchers. The second group, from Germany, India and Nigeria, has already started work. Topics range from the interpenetration of film and computer games to Bengali cinema of the 1950s and 1960s.

The Research Training Group is run in collaboration with the universities of Mainz and Marburg and the University of Art and Design in Offenbach.

<https://www.tinygu.de/configuration>

Severe progression of liver cirrhosis

The most frequent cause of death among patients with liver cirrhosis is acute-on-chronic liver failure (ACLF), where the progressive loss of function of the scarred liver can no longer be compensated for (acute decompensation). As a result, other organs such as the kidneys or brain fail.

Most frequently it is bacterial infections, hepatitis (liver inflammation) caused by alcohol abuse or a combination of both factors that triggers the acute decompensation of liver cirrhosis and ACLF. This was revealed when the PREDICT study, which was conducted by an international team of researchers, was evaluated. Lead investigator Professor Jonel Trebicka, gastroenterologist and hepatologist at University Hospital Frankfurt, is convinced: “This knowledge will help to develop diagnostic and treatment strategies for patients with this life-threatening condition.”

<https://www.tinygu.de/livercirrhosis>

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THE NEXT ISSUE



What graces desks today was invented by physicist Edme Mariotte in 1673. The colliding pendula illustrate the law of the conservation of energy later formulated by Isaac Newton: The “amount of motion” in a closed system remains the same.

DYNAMICS

From drifting clouds to quivering atoms, from immigrants and refugees to cars monitoring the flow of traffic: Motion in many contexts is a topic of research projects at Goethe University. How do you investigate a system like the brain that is constantly in motion and yet must remain stable at the same time? Why do cancer cells embark on a fatal journey and form metastases? How do film production and cinema culture change when films can be watched on smartphones and laptops? Answers and new questions can be found in the next issue of Forschung Frankfurt.

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“In science, too, we will have to deal with SARS-CoV-2 on a permanent basis. But thanks to enormous research successes, we are now better able to deal with the virus – the Goethe Coronavirus Fund has supported this gain in knowledge.”

Prof. Dr. Sandra Ciesek
Director of the Institute of Medical Virology,
University Hospital Frankfurt

“During the pandemic, it was important to provide initial aid for research projects as quickly and unbureaucratically as possible. Thanks to the support of over 2,000 donors, we were able to utilise the room for manoeuvre we have as a foundation university. Thank you very much!”

Prof. Dr. Enrico Schleiff
President of Goethe University

“At University Hospital Frankfurt, we combine research, teaching and patient care. The material and moral support that all donors have given us has helped us to handle these tasks well in the unique situation of the pandemic.”

Prof. Dr. Jürgen Graf
Medical Director and Chairman of the Board,
University Hospital Frankfurt

GOETHE CORONAVIRUS FUND

Strengthening research in Frankfurt – Weakening the pandemic!

The Goethe Coronavirus Fund: the driving force behind over 40 research projects – on immunisation and drug research, on the consequences of the pandemic for the ill, children, adolescents and the elderly, for the economy, politics and society, on the consequences for our future.

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<https://www.uni-frankfurt.de/goethe-corona-fonds>

Please help to support further pioneering research projects by donating to the Goethe Coronavirus Fund. Should you have any questions, please feel free to contact Susanne Honnef (069-798-12433 or honnef@pvw.uni-frankfurt.de).



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