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COVID-19 – VOICES FROM ACADEMIA (COVAC)

**RESULTS OF AN INTERNATIONAL SURVEY CONDUCTED
IN JULY 2021**



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RESULTS OF AN INTERNATIONAL SURVEY CONDUCTED IN JULY 2021

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KEYWORDS

Covid-19; interdisciplinary expert survey; pandemic management; global crisis; academic community

ABSTRACT

What are the expert opinions of fellow academics from diverse disciplines worldwide on critical side effects, learning opportunities, and preparedness relating to the current Covid-19 pandemic? In this summary, we present preliminary results of an expert survey conducted May-August 2021. Eighty-one opinions from Austria, Germany, Brazil, Canada, China, and other countries highlight crucial links between human health, consumption/production patterns, and ecosystem qualities. A comprehensive analysis of the multidisciplinary expert opinions also brings cumulative effects to the fore that augment existing vulnerabilities of contemporary societies. Thirdly, the results point towards the necessity of paradigmatic change within health care systems, economies, and patterns of global collaboration to prepare for future challenges.

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CONTENTS

	INTRODUCTION	7
1	METHODOLOGICAL CONSIDERATIONS AND IMPLEMENTED METHOD	8
2	CHARACTERIZATION OF THE SURVEY SAMPLE	10
3	QUALITATIVE ANALYSIS OF RESPONSES TO THE THREE OPEN QUESTIONS	13
4	DISCUSSION	16
5	LITERATURE	18
	SUPPLEMENTARY MATERIAL	19

LIST OF FIGURES

Figure 1: Respondents' country affiliations in percent	10
Figure 2: Respondents' disciplinary affiliations in percent	11
Figure 3: Participants' attribution of importance regarding each issue raised in the survey	11
Figure 4: List of ,opportunities'.	19
Figure 5: Mind map 'side effects'.	22

LIST OF TABLE

Table 1: Consent given by respondents for further exchange	12
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INTRODUCTION

The Covid-19 induced global crisis has now lasted for almost two years. We have seen different phases in how societies reacted to the challenge: the delayed acknowledgment of the scale of the threat, the following state of shock, the first national, then growingly transnational efforts to regain control over the pandemic development, the wave-like pattern of infections that resulted from repeated lock-downs and re-openings, the national vaccination programs, and the emergence and proliferation of ever new virus' variants of concern'. At the time of writing, some normalization seems possible for the near future and some regions, but not yet certain. Many open questions remain: Whether another wave of infections will happen this autumn in countries with strict pandemic management (including past lock-downs and high rates of vaccination); to which extent it will trigger another wave of deaths; what the fate of countries with less strict pandemic management or restricted access to vaccines will be.

Scientific expertise has played a central role throughout all phases and across all regions by informing the public and advising politics, developing vaccines and therapeutics, and forecasting future developments. At the same time, we have to concede that we have not yet fully brought to bear what the scientific community at large can provide to societies in a crisis like this. On the one hand, political reliance on scientific evidence has prospered; on the other, politicians and the media have relied on only a handful of experts from a few disciplines in their decision-making and public outreach. On the one hand, the public has become aware of the central role of science more than ever; on the other, alternative facts, post-truth practices, and distrust in experts have spread in unprecedented ways. Moreover, we as scientists have ourselves experienced the isolating effect of the pandemic and its management. This includes personal, disciplinary, and geographic isolation, with detrimental effects on our work and the expertise we can provide to society, including tunnel vision, short-term perspectives, and reactive attitudes.¹

Against this background, the Austrian Academy of Sciences launched an initiative to contribute to counteracting this detrimental situation. It entrusted us with conducting a survey among fellow academics from all over the world and from all disciplinary backgrounds, with an emphasis to address three pressing and possibly undervalued issues: (1) critical side effects and collateral damages of the pandemic and its management that have been unduly neglected and need to be addressed better sooner than later; (2) the most significant opportunities that arise from the certainly painful and costly disruptions the pandemic and its management has caused; and (3) potentials for action to make other such crises less likely in the near and distant future, aiming at prevention or at least better preparedness. In this report, we outline and discuss the approach and methods we implemented; we report on the results we gathered; finally, we discuss the relevance of these results in more general terms. There are thus two overarching themes to this text: enriching the available pool of expertise in the imminent Covid-19 pandemic and discussing the options we have to enact scientific community for the public good transdisciplinarily and translocally in suddenly unfolding global crises.

¹ The changing role of expertise during the pandemic is reminiscent of what Roger Pielke Jr. depicted as “tornado politics” as opposed to “abortion politics” (Pielke Jr., 2007). More detailed analyses of the shifting roles of expertise during the crisis will hopefully be provided in future work by critical policy studies scholars.

1 METHODOLOGICAL CONSIDERATIONS AND IMPLEMENTED METHOD

“Asking the expert” seems to be a more prominent feature of the current pandemic management than “asking experts”: media coverage is rife with interviews with or statements of individual scientists. During a distinct media cycle, a scientist gets branded as “the expert”, hyped as the sacrosanct conveyor of the absolute truth who should speak to power without further reflection. Later onwards, processes of downgrading often ensue, the former experts attain the status of “personae non gratae”, either when the ambiguities and uncertainties intricate to the understanding of complex systems and their future behaviour come to the fore, or when the inevitably normatively laden, political character of evidence-informed political decision making can no longer be ignored. Besides the personal challenge posed to the individual scientists (however good their intentions and however brilliant their expertise), “asking the expert” comes with two further negative ramifications: the standard quality control of the scientific collective is bypassed at least to some extent, and the full potential of integrating scientific insights from different scholars and diverse disciplines before “speaking truth” is not realized.

Thematic expert institutions that gather, analyse, and translate scientific expertise represent another constellation of conveying scientific expertise to politics and the public. In the Covid-19 pandemic such expert institutions include the WHO, the OECD, or the UNEP. These institutions can function in a global and multidisciplinary mode and can react relatively quickly. They adhere to strict internal remits, procedures, and standards, have to safeguard public trust, and depend on national governments’ financial and symbolic support. Only in hindsight will we be able to fully assess the contribution of such expert institutions in these times of crisis. On more local (primarily national) levels, decision-makers gather ad hoc and/or thematically focused expert panels and expert committees to provide policy advice. Similar expert panels are also gathered by supranational confederations including the newly established European Commission’s ‘advisory panel on COVID-19’.

A third approach to convey scientific expertise to publics and decision-makers is to gather experts’ opinions via expert surveys. Fact finding projects apply this approach when the available evidence is scarce or ambiguous, most notably with a view to the future and thus in the context of forecasting. Survey methods like the Delphi method have been specially developed to explore general lines of thought and revise and weigh them consecutively. This method targets individual anonymized experts and seeks to avoid group dynamics or influence by reputation. The Delphi method has been developed in many directions and adapted to many different contexts in the past. In most cases, it targets specific experts for specific themes with specific questionnaires. Iftekhar et al. (2021) figures as one such example in this context.

As for Covid-19, we observed that an almost endless number of surveys had been conducted up to the present, but only very few of these surveys address experts and even fewer scientists: out of 100 top-ranked surveys found via online search², 63.6% address the general public or affected subgroups such as students or people with specific health conditions, while 36.7% address expert actors like healthcare professionals, physicians of a specific field, or experts on the transportation sector³. Multiple searches⁴ yielded only two

² Google Scholar search, July 20th 2021, key words ‘Covid-19’/‘Corona’ combined with ‘survey’/‘questionnaire’.

³ These papers were interested in personal behaviour and dealings with the pandemic, in impacts on specific medical fields and diseases, mental health issues, pandemic management and decision making, education and teaching, economic ramifications, and in societal preparedness.

⁴ Similar searches were repeated for PubMed, Google scholar and Web of Science.

publications presenting findings from surveys targeting scientists from multiple locations and disciplines comparable to our survey.⁵

Compared to other surveys in the context of Covid-19, the method applied in this study stands out as it addresses scientific experts, not experts of distinct practice fields (like transportation, education or clinical medicine), or distinct sections of the population. Moreover, we did not pre-select specific disciplinary fields or confront scientists from different disciplines with different sets of questions. Instead, we opted to confront scientists from as many disciplines as possible with three open questions. We thus sought to bypass bias as to which disciplines can provide insights on these three issues and what kinds of insights can be provided. Acknowledging that the Covid-19 pandemic – though global – clearly developed very differently in different geographic locations and national regimes, we aimed at including scientists from as many continents and countries as possible.

With a perceived need to provide results as quickly as possible, we planned the project to last for no more than three months (roughly May to August 2021). The realized geographic range resulted from an aspiration to include at least four continents (Asia, Europe, South America, North America) and the pragmatic decision to focus on one country per continent, with which the Austrian Academy of Sciences had well-established connections. Thus, we reached more than 1500 scientists via the Academy's network (with the majority in Brazil and Austria⁶). We addressed additional scientists individually (following a randomized collection of addresses at renowned universities) to fill geographic and disciplinary gaps.⁷ In both cases, established university scientists (at the rank of professors) were the primary target. As to how the survey text addressed the invited scientists, we deemed three dimensions critical: firstly, we addressed the invited scientists as specialists, but also invited them to respond beyond their distinct sub-disciplinary expertise. Secondly, we sought to find a middle ground between asking experts for mere assessments about the past, present, and future and incentivizing them to formulate socio-political recommendations. Thirdly, we did make clear that we were also interested in statements relating to their specific geographic contexts.

To better characterize the resulting sample of respondents, we also collected data on age, career stage, field of research, country, and gender. Data on field of research and country were also collected for assessing relating patterns within the qualitative answers. Additionally, we asked respondents to weigh the importance of each of the three issues addressed in the three open questions. In the concluding section of the survey, we invited comments regarding the survey and provided an option to leave contact details if a subsequent exchange was welcome (provision of results, in-depth interviews or networking). We analysed the qualitative answers to the three open questions following a condensed Grounded Theory approach (Corbin et al., 2008): we coded the responses in three phases (open, axial, selective coding) directly in Excel. The development of coding mind maps (see supplementary material, Figure 5) and the keeping of research diaries supported this analytical step.

⁵ Studies comparable to our thematic focus and methodical approach include series launched by the Atlantic Council (e.g. Stewart, 2020) and Pew Research Center (e.g. Anderson et al., 2021) as well as the “World after Covid” project (Grossmann et al., forthcoming), Iftexhar et al. (2021), Wood et al. (2021) and a yet unpublished project at the German Institute of Technology Assessment and Systems Analysis (Weinberger et al., 2020). None of these projects share all attributes with our’s (comprehensive interdisciplinarity and global scope).

⁶ The list of over 760 invited members of the Austrian Academy of Sciences includes corresponding members from a wide range of countries in and beyond Europe. For Brazil, a similar number of scientists was invited to complete the survey. For China and Canada, numbers of invited scientists are not available, but presumably much smaller.

⁷ 102 additional invitations to scientists in Brazil, 305 for Canada, 118 for Austria, 172 for India, 143 for Africa.

2 CHARACTERIZATION OF THE SURVEY SAMPLE

Of the roughly 2,300 invited experts, 81 fully completed qualitative questionnaires resulted. Although this equals a relatively low response rate, it also corresponded well with the initial target of our project to elicit between 50 and 100 responses and thus to allow for a quick but comprehensive, in-depth qualitative analysis. Response rates were highest for the home institution and second-highest for the Brazilian Academy of Sciences; they were lowest for scientists addressed individually, with African addressees unfortunately not responding at all. We depict the percentage of respondents per country in the resulting sample in Figure 1.

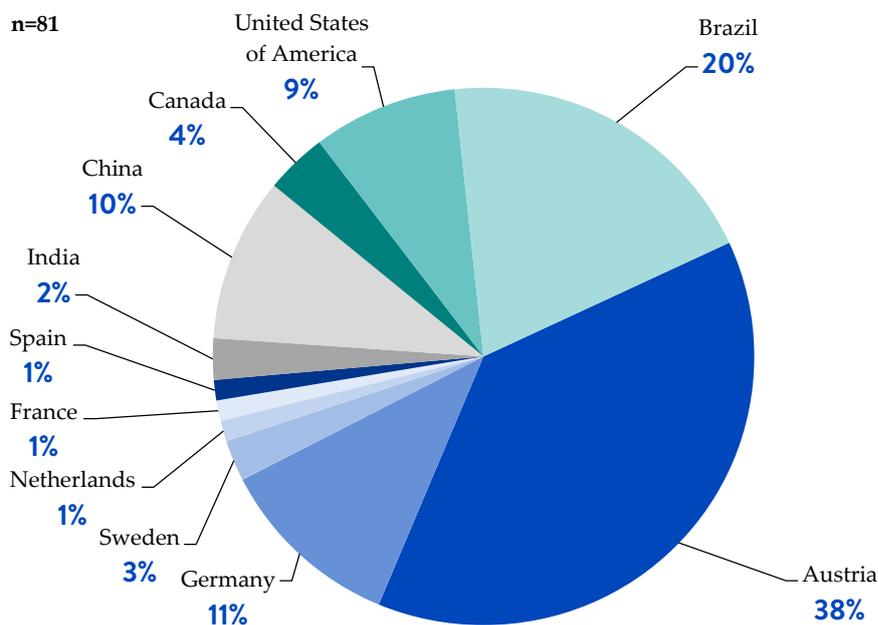


Figure 1: Respondents' country affiliations in percent

As to disciplinary affiliations (Figure 2), the biggest sub-sample stems from the natural sciences and engineering (39%), followed by humanities and arts (21%), life sciences and medicine (16%), and social sciences (14%). The rest falls into the categories clinical research and practice (4%), interdisciplinary research (4%), and other (2%). For China and Brazil, respondents stem mainly from the natural sciences and engineering or the life sciences and medicine; clinical research and practice are covered only for Austria and Canada.

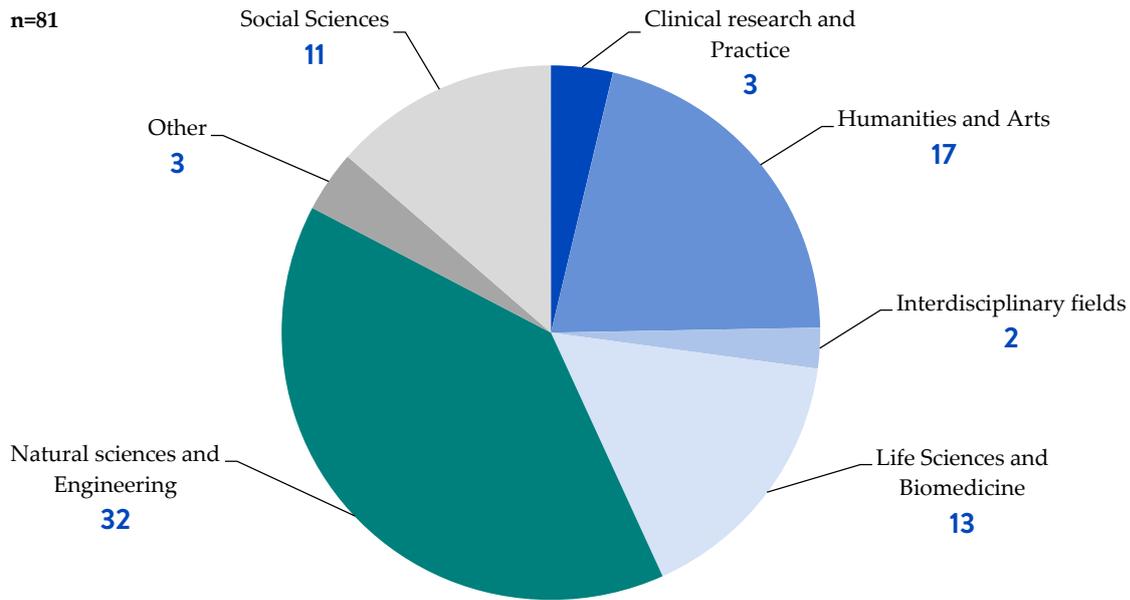


Figure 2: Respondents’ disciplinary affiliations in percent

64% of respondents are male, 35% female (1% no answer). Most respondents hold a professorship or other tenured university position (60%), 12% are retired professors, 8% postdocs, and one respondent is at the predoc level. Age distribution ranges from 26-35 (3), 36-45 (17), 46-55 (10), 56-65 (21), 66-75 (14) to >75 (16 respondents). As to the importance allocated to the three issues, issue 3 (prevention and preparedness) is seen as most unequivocally very important. The respondents see issues 1 (side effects) and 2 (opportunities) still as important or very important by the majority of respondents (see Figure 3; invited scientists that did not deem either of the three issues important did very likely not participate in the survey).

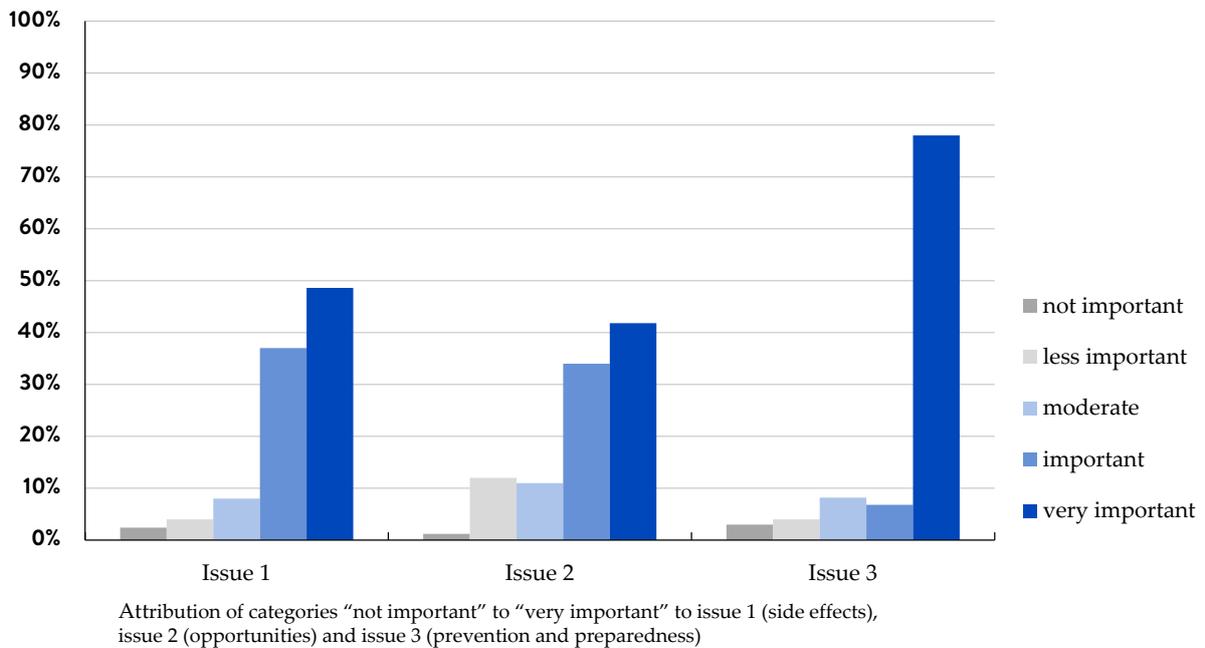


Figure 3: Participants’ attribution of importance regarding each issue raised in the survey

Survey participants could also leave a contact address (to be stored separately from the answers) and agree to three different purposes: (a) to be informed about the results of the survey, (b) to have their name mentioned with the results of the survey and (c) for any follow-up activities like interviews or networking. In total, thirty-six participants provided an email address to be informed about the results. Of these thirty-six experts, eleven were based in Austria, ten in Brazil, five in the USA, three in Canada, two in China, two in Germany, and one in France, India, and Sweden. Fifteen experts opted for having their name mentioned with the results, and ten experts volunteered for follow-up activities (see also Table 1).

Table 1: Consent given by respondents for further exchange

	Getting results (N = 36)	Mention name (N = 15)	Follow-up activities (N = 10)
AT	11	1	2
DE	2	1	1
FR	1	1	0
SE	1	1	1
BR	10	6	4
USA	5	3	1
CA	3	2	1
CN	2	0	0
IN	1	0	0

3 QUALITATIVE ANALYSIS OF RESPONSES TO THE THREE OPEN QUESTIONS

The core of the questionnaire and most of the respondents' time were dedicated to three open questions, each addressing one salient issue connected to the Covid-19 pandemic. The respondents answered overall in a very engaged mode, often delineating the maximum number of three different aspects for each issue. They often answered beyond their specific sub-disciplinary field of expertise, sometimes in reference to personal experiences as a university teacher, researcher, or private person, often regarding their geographic context. In no case, the respondents cite scientific literature. However, they often attributed science, scientificity, and scientists with a particular quality and societal role. We could also observe this position in the respondents' reaction to the three questions: responsible (and able) to act for the public good, keeping vested political or economic interests at bay.

CRITICAL SIDE EFFECTS

The first open question focused on the side effects of the pandemic and its management: *“From your expertise and professional experience: What are the most critical side effects and collateral damages of the pandemic and its management that have been unduly neglected and need to be addressed sooner rather than later?”* As stated above, almost all eighty-one respondents delineated (the possible maximum of) three aspects that they deemed essential in this respect. Analysis of responses revealed several common themes brought up by most respondents, including economic aspects, political and leadership issues, societal culture and public discourse, the conduct of life, health, and well-being. Further issues include education, science management, and communication, and ecological aspects.

Lack of or inconsistent leadership showed to be the most often mentioned issue, although differing by country (with a maximum for Brazilian experts, resonating with inter-country differences of pandemic management and development, cp. OECD, 2021). Lack of knowledge or even denial of scientific evidence on behalf of political decision-makers and hesitation to act were considered fatal for sound management of the pandemic and humankind in the long run. Respondents voiced their impression that the implementation of measures was not timely, sufficient, consistent, or adequate, diminishing trust in governments. Inadequate or even consciously misleading communication by governmental officials faced criticism, aggravated by the observation that fake news spread uncontrolled in social networks and media coverage focused on the sensational, lowering public acceptance of mitigation measures and exacerbating polarization in society. The respondents deemed deficient access to education, lack of science literacy, and/or limited access to trustworthy sources to boost vulnerability to misinformation. Unpreparedness for the pandemic and future pandemics was an issue in many responses, interpreted as neglect of responsibility and foresight by the political elites. The question of how to trust in the latter's judgment and whom to make responsible resonated with a significant number of participants.

Respondents also raised the question which parts of society were acknowledged or included in decision-making, fearing further fragmentation of society as to age, gender, health, income, and job security. Inequality was a central theme of one-third of responses: the participants saw the pandemic as more significantly affecting vulnerable parts of society than well-situated ones. Women were, for instance, seen to be affected more severely than men by shouldering the larger share of additional care work, by being exposed to increased domestic violence, and a recurrence of traditional role models. A significant number of respondents also held that – immediate medical issues aside – young people suffered disproportionately severely, especially in the long run. Again, the respondents emphasized a household's financial situation to

strongly influence whether students could attend online lessons adequately and whether their families supported them to compensate for shortcomings of online education. Geographical differences in how societies fared during the pandemic also found some resonance, partly coupled with criticism of a lack of international cooperation and solidarity. However, they received less attention than intra-societal variations in pandemic ramifications.

More than half of respondents addressed health issues as unduly considered so far: while neglecting care for physical health problems other than COVID-19 met a fair amount of attention, the majority of health-related answers approached psychological ramifications of the pandemic and mitigation measurements. Many of the respondents expected a significant increase in mental health issues like depression, anxieties, fatigue, suicidal thoughts or a worsening of already existing ailment. Mental health issues tending to manifest with delay and long term, therefore putting a burden on individuals and society for years to come, showed to be a common concern among participants. Young people and children to be affected more likely and severely was assumed in several responses, adding to the overall picture of young people being among the more affected parts of society in the long run. As the most common factor for worsening mental health conditions, participants mentioned isolation and restriction of social contacts.

Participants also referred to their working conditions in research and teaching, stating that online meetings could not fully substitute face-to-face exchange and meeting in person. They mentioned closed laboratories, canceled research trips, and loss of access to libraries and research sites and stressed the need for widespread, coordinated research and open access publication of results in the hope for faster scientific insights and development of solutions to pressing issues. Networking and career-building were also considered to suffer, primarily affecting young academics who still have to establish professional connections. Disadvantages of online teaching were picked up by a relevant number of participants. A full list of issues is provided as supplementary material at the end of this manuscript (supplementary material: mind map ‘Side effects’, Figure 5).

OPPORTUNITIES

As a second open question, we asked the participants about *“the most promising opportunities that arise from the certainly painful and costly disruptions the pandemic and its management have caused”* and how society could make the best of the sacrifices of the past twelve months. This issue had been addressed already in reaction to the first question bringing up ecological ramifications and options to learn for a more sustainable way of living, including air traffic coming to a halt and home office hours rendering commuting unnecessary. The respondents also mentioned the consumption of specific goods dropping significantly (while switching from public to private transportation to lower the personal risk of infection was considered as ecologically detrimental on the other hand).

Further answers to this second question addressed digitalization, home office, the crucial role of science, and especially biomedicine: *“In several other countries like [X], the pandemic revealed the importance of the science and research to combat this crisis. I felt that the population and the governments of these countries recognized the importance of investing in research as a tool to combat future situations like this one. In [Y], the government went in the opposite direction, and funding for research is decreasing in all fields of research.”*

Responses also acknowledged a higher awareness of the importance of face-to-face (family) contacts and enhanced international exchange and collaboration (for a complete list of issues, see supplementary material, mind map ‘Opportunities’, Figure 4). Thus, pandemic times were also seen as a time of *“creative disruption”*, although the respondents did not seem convinced that these positive aspects would last.

PREVENTION AND PREPAREDNESS

The third open question related to what we could do now to make further pandemics less likely in the near and distant future and how we could achieve more resilience concerning the emergence of global pandemics. It focused less on predicting the future than on assessments of the recent emergence and development of the pandemic and currently urgent lines of action. Compared to the two preceding open questions, it

proved to trigger the most pronounced normative statements (besides very outspoken political statements voiced as a critique of governmental action by some respondents in reaction to question 1). Important normative focus points were – above all – a prerogative to act for the public good (instead of vested interests) in all societal actor fields: in politics, industrial production and science and normative standards like solidarity, humanism, respect, empathy, honesty, global cooperativeness, justice, fairness, inclusiveness, and equity (Box 1).

Another critical element was a call for a more substantial role of science (including science education, scientific research, and scientific evidence) as a measure of prevention and preparedness. Again, this could take a normative stance when the answers in some cases called not for any science but an ‘adequate’ or ‘good’ science in the form of basic (instead of applied) science, interdisciplinary science, or alternative science education programs. A similarly paradigmatic tweak became apparent in implicit or explicit calls for “responsible leadership”, “good globalization”, “good production and consumption”, “good communication and collaboration” and “good health systems”. These sentiments all pointed towards alternative paradigms (like “global collaboration for the public good”, sustainability, local subsistence, circular economies, or the “one health” paradigm).

Box 1: Quotes for meta-code “for the public benefit”

“convince politicians and scientists serving governments and private companies that they have to work in benefit of the people”.

“We can be better prepared for future pandemics and difficulties if we follow science and place our own greed under scrutiny at all times.”

“Changing the economic and, especially, agricultural paradigm towards a more just and sustainable mode of production that is concerning with the well-being of working people and the environment.”

“Reduce inequity on a global scale: cramped living, poor hygiene, health, and education are triggers for epidemics (prevention) as well as climate change”.

“Raise awareness, that we are ALL responsible, and we are ALL in the same boat. Politics and industry in industrialized countries need to change their policies; e.g., outsourcing to other countries with less strict environmental laws, etc., will impact us all in the end.”

“Better involvement of communities and socially vulnerable groups in preparedness for crises (in general), creating infrastructures that support solidarity among citizens.”

4 DISCUSSION

With a limited response rate per country and discipline and restricted resources to go into more (scientific) detail, the representativity of the expert opinions and their evidence-base certainly warrant caution. Moreover, the validity of the results is challenged as we addressed scientists with transdisciplinary issues, triggering answers that transcend their distinct sub-disciplinary territories of certified expertise. The respondents also transcended the traditional function of basic science to state proven facts when forecasting future developments, valuing present conditions, and recommending distinct political action (cp. e.g., the very critical appraisal of social scientists' capacity to correctly forecast future developments in the context of the pandemic by Hutcherson et al., 2021). Furthermore, we could not yet look more closely at the mode of transnationality (or "globality") resulting from the multinational distribution of the survey. A further aspect to be scrutinized in more detail in the future is the (actual and ideal) interplay between individual public experts, expert communities, bottom-up expert groups, top-down expert panels and expert organizations like the WHO. Thus, we understand this study as an exploratory experiment; it provides inspirational input and connects academia transdisciplinary and transnationally rather than replacing more methodical examinations.

Having said this, the survey did yield reactions among academics that indeed address a broad range of themes. With the three issues raised by the three open questions, it relates past experiences with current assessments and future preparedness. The methodical analysis of the individual responses helps to draw a much more comprehensive picture of the pandemic, its management, and ramifications than the daily policy focus on incidence rates or individual expert opinions would allow for. Collecting the diverse issues raised by diverse experts helps see the far-ranging causal chains of the pandemic and its management and brings cumulative effects to the fore that augment the existing vulnerabilities of contemporary societies. This broad scope was rendered possible by the participation of an extensive range of disciplines, abstaining from a preselection of 'usual suspects,' be they individual experts or disciplinary fields. Moreover, our approach helped with overcoming a sole focus on the Global North or West. It thus raises awareness of the implications of the different national economic situations, political regimes, and regulatory approaches (cp. OECD 2020, Jasanoff et al., 2021), which are easily ignored with a sole focus on 'fighting the virus.' Our analysis also highlights the believe of academics worldwide in the necessity of paradigmatic change within health care systems, production/consumption patterns, and modes of global collaboration to prepare for future challenges. Overall, one main achievement of this exercise is thus to collect the wisdom already available and inspire more comprehensive policies. Another achievement is the enhancement of capacities for transdisciplinary, transnational exchange and collaboration.

Participation patterns within this survey also raise important questions about current limits in transnational academic exchange, especially regarding our failure to mobilize academics based in African countries. The approach taken thus meets the initial project goal of revealing disciplinary blind spots, short time horizons, locally-centered perceptions, or not yet duly acknowledged missing links. It contributes to a deeper understanding of the diverse, wide-ranging, and far-reaching consequences of a global crisis, one that societies will also have to build on when tackling the imminent climate catastrophe. Given the rather apolitical and matter-of-fact role scientist experts would traditionally opt for, the strong reference of the participating scientists to necessities of paradigmatic change was somewhat astonishing to us. In light of other current developments, one might ponder whether we are currently at (another) tipping point at which scientists switch to a different, less politically and normatively abstinent role. Our observation certainly adds to comparable developments in the context of the imminent climate crisis (cp. Ripple et al., 2020; Ripple et al., 2021) or digitalization (cp. e.g. emerging 'digital humanism' initiatives⁸). It also resonates with a societal role devised for and by a "scientific community at large" (that is: multidisciplinary and transna-

⁸ <https://dighum.ec.tuwien.ac.at> (accessed Sept 8th 2021).

tional) in other incidences (e.g., Bosley et al., 2015). After the formal end of our project, a multilateral Academies' of Sciences initiative⁹ even resulted in the publication of two "joint statements" that take a similarly normative stance: the "S20 Italia 2021" statement on "Pandemic preparedness and the role of science" and the "SSH20 Italia 2021" statement on "Crises: economy, society, law, and culture," acknowledging the crucial role of transnational communication, coordination, and collaboration.

We already addressed above some critical aspects of this survey's methodology. Some of these aspects are possibly unavoidable and warrant triangulation with other data resulting from alternative methodological approaches; other aspects might be further elaborated based on ensuing methodological discussions and revisions. After finishing the project, we opted to put up two aspects for further critical reflection: first, the construction of expertise, and second, the construction of globality enacted in distinct ways by the approach. Are the invited participants legitimate experts on the issues raised, and if so, in which ways? What kind of globality can result from a survey based on the invitation of experts from several continents? How do we deal with contradictory perceptions and interpretations? Who chooses (not) to participate in the various geopolitical contexts under which circumstances? As a first step to start such methodological discussion, we organized a panel together with other research teams that had conducted similar surveys (multi-disciplinary, multinational, with a focus on Covid-19) in the past (see Grossmann et al., forthcoming; Ifthekar et al. 2021; Weinberger et al. 2020) plus one expert on global studies from Brazil. The panel '(Re-)connecting Academia During a Sudden, Global Crisis' will be part of the Australian Alfred Deakin Institute's conference on *Recovery, reconfiguration, and repair: Mobilising the social sciences and humanities for a post-pandemic world* (Nov. 11-12 2021¹⁰).

⁹ "Based on consideration by the Scientific Academies of the G20 countries" (S20 Italia 2021: 1); further details of the process resulting in the formulation of the enlisted recommendations are not provided in the statement documents. As to an internet source (<https://www.eurekalert.org/news-releases/924675>, accessed Sept 8th 2021), "[i]n the run-up to the summit of the G20 states on October 30 and 31, 2021, in Rome/Italy, the science academies of these countries (Science20 Dialogue) ... have published the joint statement 'Pandemic preparedness and the role of science'. It contains recommendations – based on the experience of the response to COVID-19 – for improved pandemic preparedness in the future. The statement was prepared in virtual meetings under the leadership of the Italian Accademia Nazionale dei Lincei". The documents are signed by representatives of academies of Argentina, Australia, Brazil, Canada, China, France, Germany, India, Indonesia, Italy, Japan, Korea, Mexico, Russia, Saudi Arabia, South Africa, Turkey, United Kingdom and U.S.A.

¹⁰ <https://adi.deakin.edu.au/2021-conference-panels-and-keynotes> (accessed Sept 8th 2021).

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SUPPLEMENTARY MATERIAL

LIST OF ‘OPPORTUNITIES’:

Figure 4: List of ‘opportunities’: Each respondent could mention up to three topics per issue and most respondents opted for this maximum number. Topics addressed by respondents were sampled and grouped along overarching themes, resulting in a list depicted here as a table.

OPPORTUNITIES BEYOND THE PANDEMIC

DIGITAL REVOLUTION	digitalisation	technological improvements new possibilities by digitalisation (global) expansion of the internet
	trends in society	inclusion of disadvantaged groups by meeting online increasing knowledge about digital tools more home office in the post-COVID 19 world increased use of online meeting tools face to face services reserved for the rich; increasing social gap future: split into on-site and virtual occupations
	advantages	online formats save money online formats are eco-friendly
WORK LIFE	home office	improved quality of work life: <ul style="list-style-type: none"> flexible working hours more time for concentrated work increased productivity avoid unnecessary travel & commuting reduced stress due to home office improved quality of personal life: <ul style="list-style-type: none"> support family life more privacy increased acceptance of home office
	digitalisation in academia	more publications online hybrid & online learning increased use of online meeting tools technological improvements online meeting tools facilitate international meetings online tools ease isolation
TRENDS IN SOCIETY	collaboration	enhanced collaboration among people need to act as a community becomes evident giving up individual freedom for the sake of collective interests of society self-organisations of local systems independent of the government
	social life	increased access to knowledge increased acceptance of home office realizing importance of human contacts more time for family increasing importance of work-life balance reassessing priorities improved hygiene reevaluation of family-life

OPPORTUNITIES BEYOND THE PANDEMIC

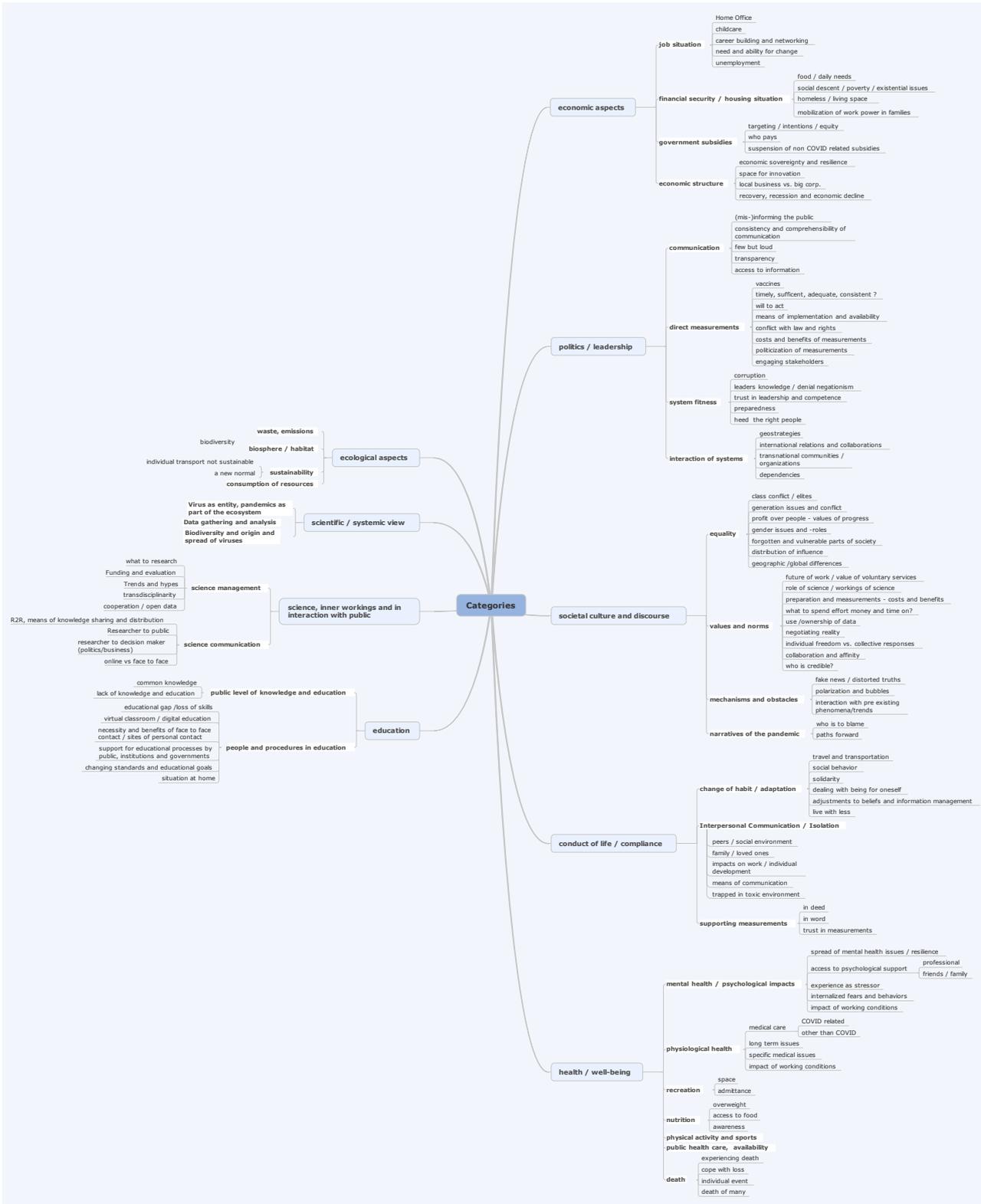
TRENDS IN SOCIETY <i>(continuation)</i>	social life <i>(continuation)</i>	<ul style="list-style-type: none"> internationalisation increasing popularity of new activities online tools ease isolation more efforts to avoid contaminations self-restraint reduction of unnecessary (but obligatory) social events the majority of people follow the new rules set by the government
	increased awareness	<ul style="list-style-type: none"> benefits of local holidays become visible importance of science importance of democracy for public rights and health people with systemically relevant professions become visible inequity and inequality in society become visible increased confidence in scientific statements and predictions increased awareness about humanity’s problems increased awareness of good healthcare increasing awareness of environmental issues awareness of fake news
	TOURISM	<ul style="list-style-type: none"> reducing mass tourism also in the future benefits of local holidays become visible more sustainable tourism
	OPPORTUNITIES OF THE ‘2ND PHASE’	<ul style="list-style-type: none"> unprivileged groups are now also paid attention to
	HEALTHCARE	<ul style="list-style-type: none"> enhancement of global health care analysis number of colds decreased increased awareness for good healthcare gain of knowledge how to ensure better protection from the flu & cold primary care
	EDUCATION AND SCHOOLS	<ul style="list-style-type: none"> need for improvement of scientific education becomes visible the importance of the internet becomes visible discussions about modalities of education increased use of online meeting tools targeted education helping young people to process the experiences gained during the pandemic more education about the benefits of vaccination
	GLOBAL COOPERATION	<ul style="list-style-type: none"> insight into collaborations between countries useful for tackling the environmental crisis increased international cooperation for vaccine and medicine development & access need to act as an community becomes evident
POLITICS & LEADERSHIP STRATEGIES	reevaluating priorities	<ul style="list-style-type: none"> need for preparation for future crisis becomes visible redistribution of wealth need for expertise, infrastructure and technologies for resilience becomes visible need for good data collection and managing strategies becomes visible need for investments in healthcare system becomes visible need for investment in education becomes visible need for investment in science becomes visible nationalization of important public areas is reasonable enhancement of global health care analysis socio-ecological transformation people with systemically relevant professions are in a better negotiation position

OPPORTUNITIES BEYOND THE PANDEMIC

POLITICS & LEADERSHIP STRATEGIES <i>(continuation)</i>	immediate responses	<p>protection of the citizens</p> <p>quick mobilization of much money</p> <p>strict control</p> <p>material and nutritional help for lower social classes</p> <p>importance of transparent communication becomes apparent</p> <p>food and shelter</p>
	future pandemic management	<p>creating jobs to ease poverty</p> <p>involvement of all health professions</p>
	inadequate response	<p>politicians should be held responsible for their irresponsible attitudes</p>
	benefits for citizens	<p>law to improve living situations</p> <p>transformation of hotels in retirement homes</p> <p>programs tackling societal inequities</p>
CHANGES IN CONSUMPTION/ PRODUCTION	<p>shift in production and consumption towards renewable resources</p> <p>production of better foods for people in isolation</p> <p>local production chains</p> <p>more responsible use of natural resources</p> <p>regional sourcing</p>	
TACKLING THE ENVIRONMENTAL CRISIS	<p>decreased pollution</p> <p>reduction of greenhouse gas emissions</p> <p>increasing awareness of environmental issues</p> <p>enforced environment-friendly behaviour</p> <p>online meetings & home office are eco-friendly</p> <p>more sustainable tourism</p> <p>insight into collaborations between countries useful for tackling the environmental crisis</p>	
SCIENCE	<p>gain of knowledge</p> <p>great achievements in biomedical research will positively affect the future</p> <p>Increased importance of science</p> <p>increased confidence in scientific predictions</p> <p>development of strategies to quickly adapt to such crisis</p> <p>involvement of all health professions</p>	
VACCINES	<p>gain of knowledge</p> <p>boost in vaccination development technology</p> <p>self-sufficiency in vaccine production</p> <p>mass vaccination</p> <p>increased international cooperation for vaccine and medicine development & access</p>	

MIND MAP 'SIDE EFFECTS'

Figure 5: Mind map 'side effects': Topics addressed by respondents were sampled and grouped along overarching themes and are depicted here as a mind map (generated by Alexander Reich).



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