



Animal Welfare.
Worldwide.

HOW TO PREVENT THE NEXT PANDEMIC?

FOUR PAWS Future Study
"COVID-19 and the interconnection between
human wellbeing, animal welfare, the
environment, and pandemics"

PREFACE

Surely some revelation is at hand

Faced with simultaneous and overlapping global climate and pandemic crises, it's tempting to think we can simply roll up our sleeves, say: "Let's get this done" and tackle things the way we humans have done for millennia. Spit in our hands, flex our muscles and get going. But this time is different. As the W.B. Yeats poem goes, to prevent things from falling apart, and anarchy being loosed upon the world; for humans to hold the center together, we must first consciously break with the trajectory we've been on for millennia. Faster, higher, further won't cut it this time, we need to rethink and change and unfortunately do all this with a rapidity that we are unaccustomed to.

If climate change wasn't enough, the global Corona crisis took humanity as a whole to an inflection point. Recognizing and acting on the interconnections between humans, animals, and environmental health is not just urgent, it is a matter of bare survival. And this time around, the way we treat animals will have serious consequences for us.

The origins of both are well understood: Deforestation is the largest cause of global habitat loss, occurring mainly because of animal agriculture. It disrupts ecosystems and forces animals and their pathogens out of their natural environments and into contact with other animals and people. Large livestock farms are also a source of infections from animals to people. Less demand for animal products and more sustainable animal husbandry would decrease infectious disease risk and lower greenhouse gas emissions at the same time.

What will we do now, what revelation is at hand? Is it the poetic, apocalyptic "rough beast, its hour come at last, slouching towards Bethlehem to be born"? Or will we do the right thing? So far, the hero of this story, us, does not appear to be in a great rush to act decisively, any impulse toward real change peremptorily extinguished by the ruling triumvirate of Inconvenience, Meat Addiction, Cowardice, assisted handily by their devoted underlings: the need to win elections, mass animal farming, the last-minute doubt and most loyal of all, self-absorption.

In this situation, workable solutions are vital, and to contribute to finding them, FOUR PAWS commissioned an independent qualitative study, in which the research institute Mauss Research, asked twenty-nine renowned experts from a variety of disciplines to look at different scenarios in order to come up with the best strategies going forward.

What emerges is, for one, that our concept of health is narrow and needs to be revised. Because human health can be safeguarded only if we also make sure that animal health and nature are defended. This idea finds expression in the more encompassing term One Welfare, instead of the narrower One Health. Another main takeaway is health policy must shift from the management of outbreaks to interdisciplinary disease prevention.

Natural resources were once presumed limitless, they aren't anymore. When faced with our survival and with a moral issue because we must pass an intact planet on to those who come after us, we learn that we fundamentally cannot do so without treating animals better: they are one of the keys because of their significance to everything from health, the economy, climate, and the environment.



Rüdiger Jürgensen
Director Germany
FOUR PAWS Germany



Josef Pfabigan
CEO/Chair of the Board
VIER PFOTEN International (FOUR PAWS)



MAIN FINDINGS – Future Study

1. Introduction: The corona crisis – a crisis in the relationship between humans, animals, and nature

There are lessons we have learned from the COVID-19 pandemic: Our way of thinking about health is outdated. Human well-being is not something that exists in a vacuum. The state of nature, our treatment of habitats and animals have a direct impact on us.

COVID-19, like approximately 75 per cent of all emerging infectious diseases worldwide, such as SARS, MERS, Ebola or HIV, are zoonoses, i.e. diseases caused by pathogens that jump from animals to humans. Zoonoses are a clear symptom of the crisis between humans, animals, and nature because they show how quickly human-caused habitat destruction can backfire. But they also underline how humans, animals and nature are indivisibly connected.

To create a better understanding of how our relationship with animals and nature must change to prevent future pandemics, VIER PFOTEN (FOUR PAWS) asked Mauss Research, an independent research institute, to conduct a study on the future, interviewing 29 renowned international experts from various fields, such as virology, human medicine, veterinary medicine, agriculture, climate, economics, law, and philosophy on three future scenarios: symptom control, preparedness for future pandemics, and their prevention. The evaluation shows the risk of pandemics would decrease if animal welfare became a central component of pandemic prevention plans. Moreover, this would have positive effects on many different aspects of our lives.

A central question refers to the approaches to health that should guide political measures to combat the pandemic. International organisations, such as the OIE, FAO, UNEP, and WHO, are currently working with the concept of "One Health," which discusses the interdependence of human and animal health. But even here, the debate falls short: health connections must be supplemented by considerations of well-being and welfare – "One Welfare" as an extension of "One Health." For only if we move away from an anthropocentric approach and take animal welfare seriously can we take preventive action against the causes that lead to pandemics.

The study's conclusion: We need a paradigm shift in the way we treat animals. This means that international institutions must identify improving animal welfare as a necessary response to COVID-19 and as an essential aspect of pandemic prevention, especially in light of the upcoming debate on an International Pandemic Treaty and the World Health Summit.

2. Summary of the results

2.1 Animal welfare is vital for the living environment

The pandemic has taught us that the health of the individual is the precondition for the health of all – humans, animals, and nature. The welfare of animals thus has a direct and indirect influence on our entire living environment. The experts express their views on thematic priorities and agreed: A higher level of animal welfare would have positive impacts on many areas of life, including human health, animal health, climate, nature, agriculture, and the economy:

- *Human health:* Human health directly benefits from animal welfare. According to the experts' assessment, today's ways of dealing with animals and nature create acute health risks for humans. When animals are kept in high stocking density and suffer from poor health and stress, they are more susceptible to disease, and pathogens can more easily jump from species to species. In 2020, the SARS-CoV-2 mutations found on fur farms jumped to humans.
- *Animal health:* The experts emphasise as particularly problematic the widespread use of antibiotics, which is necessary to keep the factory farming system running. In addition, they say, this system is particularly risky in terms of spreading diseases among animals and increases the risk of zoonotic diseases. Several times, they emphasise the health risks this poses for humans and animals.
- *Climate protection:* According to the study, reducing livestock numbers, lowering meat consumption, and turning away from factory farming are preconditions for achieving the climate targets.
- *Nature conservation:* According to the study, the systematic destruction of habitats and the loss of biodiversity are direct consequences of today's factory farming. This decrease in overall genetic diversity makes it easier for pathogens to evolve and spread amongst fewer hosts. According to the interviewees, this threatens the resilience of entire ecosystems against infectious diseases. The experts emphasise throughout the study: protecting natural habitats is therefore crucial to safeguarding animal welfare and human well-being.
- *Agriculture:* The experts stated with a large majority that animal husbandry is an important starting point for the paradigm shift in our relationship with animals. Factory farming forces animals into cruel living conditions, increases the risk of zoonotic diseases, and destroys natural habitats for feed crops or pasture. It must therefore be the objective of international organisations and national governments to present an overall strategy for an animal-friendly as well as environmentally and climate-compatible restructuring of agriculture and food production.
- *Economy:* The enormous costs of dealing with the pandemic could be used as an argument, the experts say, to build public support for pandemic prevention and to effect change in human behaviour. Food systems and diets over-reliant on animal products have negative impacts on the climate, animals and human health. They also increase the risk of zoonotic disease outbreaks and future pandemics. Policymakers should therefore ensure that the production and consumption of animal protein are no longer subsidised, and that plant-based, more sustainable food systems are promoted instead.

2.2 Animal welfare is key to prevent future pandemics

The corona crisis was not created by a supernatural force; it was man-made, just like the climate crisis. The future study shows which priorities must be set in order to minimise the risk of future pandemics:

Current scientific and political discussions on "One Health" should be thought of in a less anthropocentric and more holistic and interdisciplinary way and include animal welfare and climate protection. The key to preventing future pandemics is not simple symptom control in the form of medication and isolation of animals, but a real paradigm shift towards greater animal welfare and prevention: "One Welfare".

To prevent future pandemics, the experts suggest limiting behaviours that adversely affect wildlife habitats and reducing the consumption of animal products. Furthermore, they call for interdisciplinary pandemic prevention strategies and interdisciplinary policies that take into account the interactions of humans, animals, and nature.

The majority of experts say: Scenario 2 (preparedness and response) is most likely (but not effective to prevent future pandemics), but Scenario 3 (prevention, animal welfare is implemented) would be most effective to prevent the next pandemic.

The study's experts clearly advocate a scenario in which factory farming gradually ends, fur farms and live animal markets are closed, and plant-based diets increasingly replace meat consumption. Animal welfare should be part of the next Sustainable Development Goals (SDGs) after 2030.

To get there, the experts of the study recommend the following measures, among others:

Investments in plant-based products and cellular agriculture: The market for plant-based alternatives is growing compared to that of animal products. Government investments in research in these areas would help produce the same nutrients without zoonotic risk or animal suffering.

An interdisciplinary and cost-benefit approach: Policymakers must address pandemics in an interdisciplinary frame that includes prevention and animal welfare and recognise the costs tied to response compared to the costs of preventive measures.

Awareness-raising: The close interconnection between human and animal well-being should become part of scientific, political, and social discourses.

3. Political demands – we must change our relationship with animals and nature

The COVID-19 crisis has placed pandemics and zoonoses at the top of the global agenda. While the link between animal welfare and increasing pandemic risk is well established

scientifically, the political will to tackle the root causes is absent. If we miss this opportunity to learn our lessons and act accordingly, we are destined to walk right into the next pandemic.

The conclusions to be drawn from the future study in terms of politics should therefore be as follows: Any policy decision that dismisses animal, environmental and climate protection as secondary concerns is a decision *that supports* the crisis and increased pandemic risks.

FOUR PAWS thus recommends the following political priorities so that we can prevent future pandemics:

- Animal welfare and climate protection must be prioritised on a global scale.
- Animal welfare measures are crucial elements for all pandemic prevention strategies and legislation.
- The "One Welfare" framework must be incorporated into policy making.
- Agricultural and farming systems must evolve beyond intensively produced animal products to enable food systems that are less reliant on animal derived materials.
- Practices that increase the risk of zoonotic disease occurrence and spread, which include the commercial trade in wild animals, fur farming, factory farming, and the trade in dog and cat meat, must be prohibited.

Now is the time to build that political will. As a global animal welfare organisation, FOUR PAWS calls for science driven policy making and the political recognition of the human-animal-environment bond (One Health - One Welfare) at the highest political levels. FOUR PAWS wants to make sure that international institutions and national governments recognise animal welfare improvements as a crucial part of the COVID-19 response and prevention of future pandemics, especially in the upcoming debate on the Pandemic Treaty.

These and other phenomena point to a simple truth: If we want to safeguard the well-being of all life, we must change our relationship with animals and nature.

This study was commissioned by FOUR PAWS and conducted by Mauss Research.



ANIMAL WELFARE AND PANDEMICS

29 in-depth interviews à 53 minutes
with global experts
for FOUR PAWS
October 2021

Mauss Research
Zehdenicker Straße 11
10119 Berlin

Fon: 030-69204016-0
Fax: 030-69204016-9
Email: amauss@mauss-research.de

Responsible for conducting the study: Alexander Mauß

21. October 2021



STUDY BRIEF

Client	VIER PFOTEN International
Methodology	In-depth telephone interviews
Dates of interviews	03.08.2021 – 23.09.2021
Participants	Global experts from different fields who could relate to the topics of animal welfare and pandemic prevention
Recruitment of the participants	VIER PFOTEN
Number of interviews	29
Duration of the interviews	53 minutes (on average)
Discussion guide / Conducting the interviews / Analysis	Mauss Research
Responsible for conducting the study	Alexander Mauß, Mauss Research +49 30 6920 40160 amauss@mauss-research.de



TABLE OF CONTENTS

I. EXECUTIVE SUMMARY.....	5
II. METHODOLOGICAL BACKGROUND	9
III. DETAILED ANALYSIS.....	16
1. Introduction to the topic.....	17
a) Influence of animal welfare on the prevention of pandemics.....	18
b) Main suggestion to prevent future pandemics.....	20
2. One Health.....	24
a) General knowledge of One Health	24
b) Varying assessment of One Health: Anthropocentric or Holistic?.....	25
c) Hindrances to implementation	27
3. Scenarios: Overview.....	31
4. Scenario 1: Symptom Control.....	32
a) Effectiveness for Preventing Future Pandemics.....	32
b) Likelihood of being part of an international Agreement.....	34
c) Implications for animal welfare	36
d) Implications for human well-being.....	37
5. Scenario 2: Preparedness and Response	37
a) Effectiveness for Preventing Future Pandemics.....	38
b) Likelihood of being part of an international Agreement.....	40
c) Ways for promoting/Advancing this scenario.....	43
d) Implications for animal welfare	44
e) Implications for human well-being.....	45
6. Scenario 3: Prevention	46
a) Effectiveness for Preventing Future Pandemics.....	46
b) Likelihood of being part of an international Agreement.....	50
c) Ways for promoting/advancing this scenario	53
d) Implications for animal welfare	56
e) Implications for human well-being.....	58



7. One Welfare	61
a) Awareness	61
b) Initial impression	61
c) One Health and One Welfare	64
d) Suggestions for Advancing One Welfare	68
IV. CONCLUSIONS	71
V. REFERENCES	74



I. EXECUTIVE SUMMARY

FOUR PAWS has commissioned Mauss Research to conduct 29 in-depth telephone interviews on the future of human-animal relationships after COVID-19, with renowned international experts from several disciplines. The interviews were conducted between August 3 and September 23, 2021 and lasted on average 53 minutes each.

The goal of this study is to contribute to the deliberations at the World Health Summit in October 2021 and in other contexts regarding consequences drawn in the global health architecture as a result of the global response to the COVID-19 pandemic and the potential creation of an international treaty on pandemic prevention.

This study and the underlying interviews address the influence of animal welfare on the prevention of pandemics, One Health, three scenarios that might be included in a potential agreement on pandemic prevention, and One Welfare.

INFLUENCE OF ANIMAL WELFARE ON PREVENTION AND MAIN SUGGESTIONS TO PREVENT FUTURE PANDEMICS

Human contact with wild animals is seen by the interviewees as the root cause of zoonotic pandemics (zoonoses are diseases that can spread between animals and humans, such as flu, rabies and Rift Valley Fever), while poor animal welfare – especially relating to farm animals – is regarded by respondents to be an influencing factor that could contribute to their spread.

To prevent future pandemics from happening, respondents suggest reducing behaviors that interfere with wild animal habitats and reducing the consumption of animal agriculture products. Furthermore, they called on interdisciplinary pandemic prevention strategies, as well as interdisciplinary policy formulation.

ONE HEALTH

'One Health' is an approach to designing and implementing programs, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes. The One Health concept is well known by the majority of respondents. The concept has attracted some criticism for its anthropocentric focus, as it is said to focus mainly on human health aspects and neglect the health of the environment and animals. However, interviewees

who had worked closely with the One Health concept often lauded it as being holistic. Furthermore, various factors impede the implementation of One Health, such as economic factors and special interests, as well as the siloed nature of the different fields within One Health.

THREE SCENARIOS THAT MIGHT BE INCLUDED IN AN INTERNATIONAL AGREEMENT ON PANDEMICS

At the core of the future study is the discussion of three fictitious scenarios that might be part of an international agreement on pandemics:

- Scenario 1 “Symptom Control”: The first scenario focuses on controlling the consequences of the pandemic by employing vaccination campaigns and monitoring biosecurity.

The scenario is generally perceived – by nearly every respondent – as not being effective in preventing future pandemics. The majority of the experts clarify this by stressing that this scenario doesn’t tackle the root causes of the pandemic: it is only reactive and doesn’t address human behavior. Some of the experts stress that this scenario describes the status quo in which the public discourse focuses on vaccination while animal welfare, biodiversity, and climate change are only marginal issues, and hence “nothing changes”.

Scenario 1 is perceived as being moderately likely: it ranks second after Scenario 2 and is seen as more likely than Scenario 3. Some respondents stress that this scenario is likely because it doesn’t require a lot of change and is compatible with the current system, hence being fairly easy to agree to. This goes hand in hand with business interests benefiting from the status quo and other groups not pushing strongly enough for change. The main argument for perceiving this scenario as not likely – voiced by a few experts – addresses the notion that public and professional discussions are beyond this scenario and a more ambitious approach will be more likely.

- Scenario 2 “Preparedness and Response”: The second scenario focuses on international collaboration and small measures regulating zoonotic outbreak hotspots.

This scenario is perceived as being more effective than Scenario 1 but less effective than Scenario 3 in preventing future pandemics. Its effectiveness is mainly explained by reducing future outbreaks and improving early responses, while the criticism focuses on not addressing root causes.

Regarding the likelihood of being part of an international agreement on pandemics, this scenario is seen as most likely. Respondents frequently stressed that Scenario 2 covers the middle ground between Scenario 1 and Scenario 3: better preparedness and response is seen as necessary, but the major transformation of Scenario 3 is seen as highly unlikely.

- Scenario 3 “Prevention”: This scenario places the strongest emphasis on preventing future pandemics by promoting several major changes.

Unsurprisingly, this scenario – which already includes “prevention” in its name – is rated as being the most effective in preventing future pandemics. However, in their reasoning the experts don’t focus on the title but rather the contents of the scenario. This scenario is seen as most effective for mainly two reasons: less contact between humans and animals and – aside from specific measures – a generally holistic approach.

As unanimously as this scenario is seen as being the most effective, it is also seen as the least likely because it demands too much change. Being the least likely scenario is primarily explained with two arguments: economic interests combined with missing political will preventing it and cultural/behavioral aspects that prefer the status quo.

Suggestions for promoting/advancing this scenario include a stronger push for plant-based products and cellular agriculture, coalition building with the climate change movement, and educating and promoting social change.

This scenario is perceived as having many positive implications for animal welfare, e.g. reducing industrial animal agriculture, and banning wildlife trade. Additionally, this scenario is also perceived as having positive implications for human well-being, e.g. health implications based on eating less meat, safeguarding the environment, and fighting climate change.



ONE WELFARE – AND IT COMPLEMENTING ONE HEALTH

One Welfare is a concept that serves to highlight the interconnections between animal welfare, human well-being and the environment. It seeks to extend the approach of One Health used for human and animal health. The initial impression of One Welfare is primarily positive. However, due to many respondents being unfamiliar with the framework, the responses were often slightly vague. Nevertheless, respondents appreciate the concept's multidisciplinary outlook.

The respondents largely feel that there is need for One Welfare to complement One Health and that introducing a second concept will not infringe on the progressing of either. However, some respondents feel that One Health is sufficient and that One Welfare would be redundant, while there are also some concerns that adding a further concept would perhaps become a distraction. The most common suggestion for advancing One Welfare is educating the public about the framework.



II. METHODOLOGICAL BACKGROUND

FOUR PAWS has commissioned Mauss Research to conduct 29 in-depth telephone interviews on the future of human-animal relationships after COVID-19, with renowned international experts from several disciplines. The interviews were conducted between August 3 and September 23, 2021 and lasted on average 53 minutes each.

The goal of this study is to contribute to the deliberations at the World Health Summit in October 2021 and in other contexts regarding consequences drawn in the global health architecture as a result of the global response to the COVID-19 pandemic and the potential creation of an international treaty on pandemic prevention.

RECRUITMENT OF THE PARTICIPANTS

The recruitment of the participants had the goal of achieving a broad variety of experts from different fields of expertise who can relate to the topic to obtain different perspectives. Each participant was initially contacted by FOUR PAWS and invited to participate in the study. The following table lists the number of interviews per field of expertise. While many experts can obviously fall into several fields of expertise at the same time, each expert is only assigned to a single

Field of Expertise	Interviews
Animal Health	7
Economy	1
Environment/Climate	6
Health	4
Law	2
Nutrition&Food	3
Social Sciences	6
Total	29

category.

The following experts participated in the interviews (in alphabetical order), and their views expressed don't necessarily express those of the organization(s) for which they work. Many experts are active in several organizations, and in this table only one organization is listed:



Title	Name	Profession / Organization	Field of Expertise
Dr.	Gesa Busch	Research Associate, Department of Agricultural Economics and Rural Development Marketing for Food and Agricultural Products, University Göttingen	Nutrition&Food
Dr.	Martina Bozzola	Queen's University Belfast	Economics
Dr.	Natalia Cediel	Professor and researcher, La Salle University, OHHLEP	Animal Health
Ph.D.	Abhishek Chaudhary	Assistant Professor, Indian Institute of Technology (IIT) Kanpur/ OHHLEP	Environment/ Climate
PhD Candidate	Susan Chiblow	PhD Candidate, York University	Social Sciences
Dr.	Nitish Debnath	Coordinator, One Health Bangladesh / FAO / ECTAD	Animal Health
Dr.	Jim Desmond	Eco Health Alliance	Animal Health
Dr.	Jan Dutkiewicz	Postdoctoral Fellow, Swiss National Science Foundation/ Policy Fellow, Harvard Law School	Law
Dr.	Rebeca Garcia Pinillos	Director, One Welfare	Animal Health
Dr. med.	Renzo Guinto	Director, Planetary and Global Health Program St. Luke's Medical Center College of Medicine, Philippines	Health
Dr. med.	Ghazi Kayali	Chief Executive Officer, Human Link	Health
Dr.	Natalie Khazaal	Assistant Professor, Georgia Tech	Social Sciences

Title	Name	Profession / Organization	Field of Expertise
Prof. em. Dr. phil.	Helga Kromp-Kolb	Professor emeritus, University of Natural Resources and Life Sciences Austria	Environment/ Climate
Wildlife and Live Animal Markets Fellow	Ann Linder	Animal Law and Policy Program, Harvard Law School	Law
Dr.	Imke Lührs	Ärzte gegen Massentierhaltung	Health
	Mia MacDonald	Executive Director, Brighter Green	Environment/ Climate
Dr.	Syra Madad	Infectious Disease Epidemiologist, Harvard Belfer Center for Science and International Affairs and Senior Director, System-wide Special Pathogens Program Office, NYC Health + Hospitals	Health
Dr. med. vet.	Michael Marahrens	Deputy head, Institute of Animal Welfare and Animal Husbandry (ITT)	Animal Health
Dr.	Moreno di Marco	Sapienza University of Rome; Dept. Of Biology & Biotechnologies	Environment/ Climate
Dr.	Josh Milburn	British Academy Postdoctoral Fellow, University of Sheffield	Social Sciences
Dr.	Serge Morand	Research Director CNRS, University of Montpellier / OHHLEP	Environment/ Climate
Dr.	Hanns Moshhammer	Deputy Head, Medical University of Vienna	Environment/ Climate

Title	Name	Profession / Organization	Field of Expertise
Dr.	Angie Pepper	Lecturer, University of Roehampton, London	Social Sciences
Prof. Dr.	Jean-Loup Rault	Head of the Institute of Animal Husbandry and Animal Welfare, University of Veterinary Medicine Vienna	Animal Health
PD Dr.	Mieke Roscher	Professor, Social and Cultural History (Human-Animal Studies), University Kassel	Social Sciences
Dr.	Kurt Schmidinger	Food scientist and geophysicist, founder of futurefood.org, member of the advisory boards of Good Food Institute, Albert Schweitzer Stiftung and other NGOs, affiliate at FEWD and the University of Vienna	Nutrition&Food
Dr.	Dinesh Wadiwel	Senior Lecturer, School of Social and Political Sciences, The University of Sydney	Social Sciences
Prof. Dr. med. vet.	Christoph Winckler	Professor, University of Natural Resources and Life Sciences, Vienna	Animal Health
Prof. Dipl.-Ing. Dr.	Werner Zollitsch	University of Natural Resources and Applied Life Sciences	Nutrition&Food



METHODOLOGY OF ANALYSIS

The analysis of Mauss Research is based on the methodology of qualitative content analysis (according to Mayring, among others). This approach is characterized by three central features:

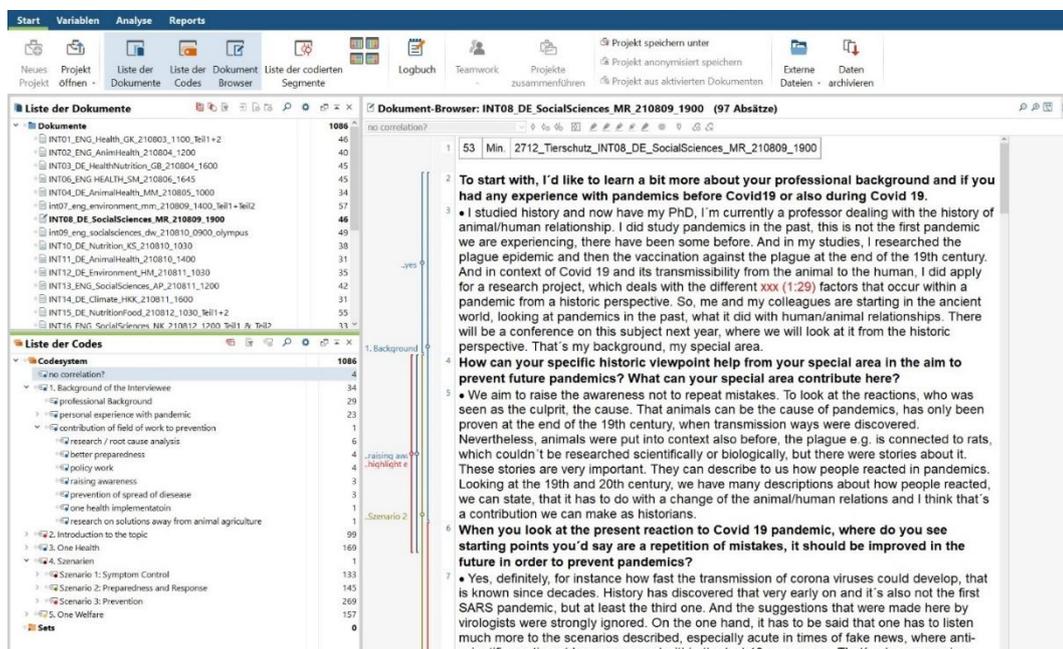
First, the statements of the interviewees are considered within a **person-related and situational context**. Sociodemographic information (e.g., occupation, origin, etc.) as well as social and/or cultural characteristics of the interviewees are taken into account.

Second, in contrast to open modes of evaluation (as in hermeneutic procedures), qualitative content analysis is **based on rules**, i.e. predefined and intersubjectively comprehensible rules in the creation of the category system. In the process, a mode for coding is established in advance of the evaluation, which defines basic dimensions and perspectives. On the one hand, this ensures a transparent content-analytical process model (reliability), whereby repeated coding would lead to (as far as possible) identical results. On the other hand, this rule conformity offers the possibility that text analysis and categorization can be performed by several independently acting researchers (intercoder reliability).

Third, the continuous development of the **category system** is at the center of qualitative content analysis. On the one hand, this is formed in advance of the analysis based on the discussion guide (deductive). In this process, categories are defined and coding rules are established. On the other hand, the category system is generated and expanded based on the interviews (inductive). In this process, the categories are continuously adjusted and reviewed to maintain the exclusivity of the categories. Deductive and inductive procedures overlap and complement each other.

ANALYSIS WITH MAXQDA

The core element of the qualitative content analysis is MAXQDA, a professional software for qualitative text analysis. MAXQDA supports the iterative and systematic development of a category system and makes it transparently available. With the help of the software, individual statements of the interviewees are assigned to a category system, which allows making statements about frequencies. However, at the same time, what was actually said – in the form of quotations – is preserved.



The screenshot displays the MAUSS RESEARCH software interface. It features a top menu bar with 'Start', 'Variablen', 'Analyse', and 'Reports'. Below this is a toolbar with icons for 'Neues Projekt', 'Projekt öffnen', 'Liste der Dokumente', 'Liste der Codes', 'Liste der codierten Segmente', 'Logbuch', 'Teamwork', 'Projekte zusammenführen', 'Projekt speichern unter', 'Projekt anonymisiert speichern', 'Projekt aus aktivierten Dokumenten', 'Externe Dateien', and 'Daten archivieren'.

The main workspace is divided into three panes:

- Liste der Dokumente (top left):** A list of 16 transcribed interviews, each with a file name and a page count. The selected document is 'INT08_DE_SocialSciences_MR_210809_1900' (97 Absätze).
- Liste der Codes (bottom left):** A hierarchical tree structure of codes. The selected code is 'no correlation?'. Other codes include 'Background of the Interviewee', 'professional Background', 'personal experience with pandemic', 'research / root cause analysis', 'better preparedness', 'policy work', 'raising awareness', 'prevention of spread of disease', 'one health implementation', 'research on solutions away from animal agriculture', 'Introduction to the topic', 'Scenario 1: Symptom Control', 'Scenario 2: Preparedness and Response', 'Scenario 3: Prevention', and 'Scenario 5: One Welfare'.
- Dokument-Browser (right):** A window showing the text of the selected document. The text is numbered 1 through 7, corresponding to the code list. The text discusses the author's background in history and their research on pandemics, specifically mentioning the plague epidemic and the vaccination against the plague at the end of the 19th century. It also discusses the transmission of corona viruses and the importance of listening to virologists.

In the *Liste der Dokumente* (window top left) are all transcribed interviews listed separately.

The *Dokument-Browser* (right window) displays the current interview in which the text segment is linked to the category system.

During coding, the marked text segments are assigned to a category system in the *Liste der Codes* (bottom left window). This category system is developed step by step and can comprise several levels depending on how fine-tuned the analysis is.

FREQUENCIES

The following table offers an indication of the frequencies behind key terms used in the evaluation, such as "isolated," "some," or "majority":

key term	frequencies (proportionally)	N=29
single respondent		1
sporadically	6 to 10 percent	2 to 3
a few	11 to 15 percent	4 to 4
some	16 to 30 percent	5 to 9
frequently	31 to 50 percent	10 to 15
majority	51 to 75 percent	16 to 22
generally	more than 75 percent	23 to 29

HANDLING OF QUOTATIONS

To facilitate readability, quotations have been linguistically smoothed where necessary, whereby no change in content has taken place. After each quotation, the following characteristics of the interviewees are included: *Interview #, Field of expertise, Name of the respondent (if the person agreed to a personalized analysis).*

METADATA

In order to enable a more in-depth and differentiated analysis, the following metadata – among others – were stored in the MAXQDA analysis file for each interview or interviewee and used for the analysis: *field of expertise*

QUALITATIVE APPROACH: NO CLAIM TO REPRESENTATIVENESS

This study does not claim to provide representative results in the statistical sense; rather, the focus is on gaining a deeper understanding of the interviewees, i.e. their perception of One Health, the three scenarios, and One Welfare. In this way, the various facets of these topics are to be highlighted and illuminated in greater detail so that this can be taken into account when discussing the future of human-animal coexistence.



III. DETAILED ANALYSIS

FOUR PAWS has commissioned Mauss Research to conduct 29 in-depth telephone interviews on the future of human-animal relationship after COVID-19, with renowned international experts from several disciplines. The interviews were conducted between August 3 and September 23, 2021 and lasted on average 53 minutes each.

The goal of this study is to contribute to the deliberations at the World Health Summit in October 2021 and in other contexts regarding consequences drawn in the global health architecture as a result of the global response to the COVID-19 pandemic and the potential creation of an international treaty on pandemic prevention.

This study and the underlying interviews address four areas of interest:

- Introduction to the topic: Influence of animal welfare on the prevention of pandemics and suggestions for preventing future pandemics.
- One Health: General knowledge of the topic, assessment, and hindrances to implementation.
- Three scenarios that might be included in a potential treaty on pandemic prevention: 1) Symptom Control, 2) Preparedness and Response, and 3) Prevention.
- One Welfare: General knowledge of the topic, and comparison to One Health.

Acknowledgement: This study is based on the extensive knowledge of 29 experts who were willing to participate in the in-depth interviews. The experts are listed by name in the methodological background of the study. The experts were chosen from different fields of work to provide broad access to the topic. The analysis was conducted by Mauss Research and didn't involve the experts.

1. Introduction to the topic

a) Influence of animal welfare on the prevention of pandemics

1. INTRODUCTION TO THE TOPIC

The global response to the outbreak of COVID-19 has sparked multiple debates, response measures and policies. To a certain degree, the global COVID response has been able to build on mechanisms such as the Coalition for Epidemic Preparedness Innovations (CEPI) to enable the speedy development and distribution of COVID vaccines (The Coalition for Epidemic Preparedness Innovations, 2020), while building on learnings from the Ebola outbreaks in 2014-2016 (The Global Coalition for Epidemic Preparedness Innovation, 2021). Despite existing mechanisms and collaboration among institutions, the financial mechanisms meant to allocate support for international pandemic response early in the pandemic (the WHO's Contingency Fund for Emergencies and the World Bank's Pandemic Emergency Financing Facility (PEF)) were neither considered sufficient nor quick enough and governments were unwilling to finance a concerted international response. Financing challenges along with "insufficient global coordination, overly nationalistic approaches, and gaps in pandemic preparation by national governments and international organizations allowed COVID-19 to spread uncontrolled, killing millions around the world, also leading to enormous economic losses" (Friends of the Global Fund Japan, 2021). These detrimental consequences were sufficiently compelling to build the case for further action, triggering the creation of independent expert panels as well as deliberations towards initiating global processes and reforming global pandemic preparedness.

This chapter assesses the relevance of animal welfare on the prevention of pandemics. Overall, the majority of respondents view animal welfare as having a clear influence on the prevention of pandemics.

Although human contact with wild animals is seen by the respondents as the root cause of zoonotic pandemics, poor animal welfare – especially relating to farm animals – is regarded as a catalyst or influencing factor that could contribute to their spread.

Experts were also asked to provide suggestions on how to prevent the next pandemic. Respondents favor the reduction of behaviors that interfere with wild animal habitats and reduce the consumption of animal agriculture products.

1. Introduction to the topic

a) Influence of animal welfare on the prevention of pandemics

Further suggestions include the need for an interdisciplinary approach to pandemic prevention, as well as interdisciplinary policy formulation. Respondents also share a host of different suggestions on how their individual professional fields could aid in preventing and preparing for pandemics.

Finally, it is deemed desirable to present economic arguments in favor of pandemic prevention.

a) INFLUENCE OF ANIMAL WELFARE ON THE PREVENTION OF PANDEMICS

Experts were asked how they assess the relationships between animal welfare and the prevention of pandemics. The majority of respondents describe that there indeed is a clear influence of animal welfare on the prevention and spread of pandemics. Due to the very nature of zoonoses spreading between animal and human species, experts feel that this influence is present at various animal-human interfaces.

Further underscoring the close link between animal welfare and pandemic prevention, respondents describe that new pathogens introduced to humans are most often of a zoonotic nature, infecting humans either directly or indirectly via an intermediary host.

"At the end of the day, the big answer is yes. There are linkages. Animals, whether domesticated or wild, do carry microbes or pathogens that can have pandemic potential. The next pandemic could be lurking around an animal farm in a city or town or in an endangered species [...]. So, yes, animal welfare is quite critical. That means animals are quite central to the pandemic prevention discourse. And therefore, we need to start really investigating, really examining how we are going to relate to animals." [INT19: Health | Renzo Guinto]

"We know that 70 percent of all emerging and reemerging pathogens are zoonotic, that jump from animals to humans. It can happen without any warning. I think that it goes to show you that there's a significant influence and a significant factor related to animals that influence human health and vice versa. [INT06: Health | Syra Madad]

"The interface between our community, the human community, and the animal community is of course what causes disease emergence risk to go higher or lower. The way in which we interact with animals, both domestic and wild animals, is what ultimately causes diseases to emerge. Let's bear in mind that the vast majority of recently emerged pathogens have zoonotic origin, they come from wildlife and they get into humans either directly or through an intermediate host that could be livestock for example." [INT07: Environment/Climate | Moreno di Marco]

"It depends how close we live together with certain animals, how close we are able to or should live together with them. The close proximity of animals and humans, which happens with dogs and cats in the private homes. They have lived with us for thousands of years, and we are used to their viruses. It doesn't mean this is the case with other species; the closer proximity to what used to be wild animals leads to transmission of pathogens between them and us." [INT08: Social Sciences | Mieke Roscher]

1. Introduction to the topic

a) Influence of animal welfare on the prevention of pandemics

The interviews also show that certain animal industries are perceived as especially risky regarding the spread of diseases among animals, as well as promoting the risk for zoonoses. The industry that is most often cited in this regard is factory farming, as the sector frequently demonstrates poor animal welfare conditions such as high animal stock numbers and a very close proximity of the animals to each other within a stock or farm site.

"If we think of welfare, we think about enough space to exist and exhibit natural behaviors and such things. And so, low welfare then would be animals that are packed very closely together, which also tends to be the same types of qualities that allow for the more, easy transmission of zoonotic disease. So, oftentimes those two things tend to go hand-in-hand." [INT27: Health | Imke Lührs]

Poor conditions in factory farming are thought to promote the likelihood of secondary issues that affect animal stocks, which could in turn contribute to the spread of diseases. A condition most often described regarding this is "stress".

"The lack of concern for animal welfare, let alone animal rights, in large scale animal agriculture is a contributor to zoonosis and pandemics. We know for sure this is the case with antibiotic resistance, because of the routine use of antibiotics. The potential for disease in very large, crowded, dirty, unsanitary facilities, where obviously the animals are stressed and their immune systems weakened." [INT20: Environment/Climate | Mia MacDonald]

To counteract potentially poor health outcomes, the increased use of antibiotics in farming is reported by respondents. The intensification in the use of antibiotics is understood as a further factor that could benefit the spread of diseases in the future by increasing pathogen resistance to antibiotics.

"Another increasing problem, which we could observe in my professional years are intestinal pathogens, which are prevalent both in humans and animals. Again, they do not necessarily cause diseases, but these pathogens can be resistant to many different antibiotics. And again, in an immunosuppressed organism or on antibiotic treatment, they can prevail and cause severe general infections." [INT27: Health | Imke Lührs]

"I can very clearly see that the emergence of new pathogens and the emergence of antimicrobial resistance are associated with the intensification. We do not take care of the animal welfare under this production system as good as we want." [INT18: Animal Health | Nitish Debnath]

One respondent feels that no link between animal welfare can be established regarding factory farming and the spread of pandemics.

"Animal welfare is very important to me. But pandemic control will not be an argument if you want to prohibit fur farms or factory farming or cage-rearing [...] because the correlation is not strong enough. Those who work on health protection and pandemic control will certainly have different aspects they focus on." [INT12: Environment/Climate | Hanns Moshhammer]

1. Introduction to the topic

b) Main suggestion to prevent future pandemics

Some interviewees point to human behaviors that interfere with wild animal habitats or infringe on wild animal welfare as the root cause of zoonotic pandemics.

"The pandemics we had, e.g. SARS, meaning the earlier SARS and now COVID, are not pandemics that have developed within industrial farming. They have to do with nutritional habits, with attitudes of humans to animals, but I don't see the direct context. I would see an indirect context and I see the connections, but I don't see the primary cause in the form of agricultural animal husbandry." [INT11]

"All the big problems we had with viruses in the recent years – whether the ones that caused pandemics like COVID-19 now (with) the virus SARS COV-2, or the pandemic we had in 2009 with the H1N1, which was called swine flu, or the one before that, which was SARS in 2003 – they all come from animal reservoirs, and they move from one species to another because of human behavior. So, the virus in its natural reservoirs does no harm. But when we go and decide to meddle in wildlife business, then we are likely to get exposed to the viruses. And we also have several outbreaks that also showed the involvement of human behavior in causing not pandemics, but big epidemics, such as the Ebola epidemics in Africa. This is also a virus that lives in the bats." [INT01: Health | Ghazi Kayali]

Furthermore, one respondent sees a qualifying aspect or even a negative linkage between good animal welfare and pandemic prevention. When trying to curb the spread of diseases between animals and zoonoses, farm animals are often isolated, locked away, or culled. Such actions are not congruent to the welfare of an animal, although these actions could aid in the prevention of pandemics in the short term.

"When it comes to the spread of bird flu, keeping animals indoors prevents the animals spreading the flu. Yet keeping animals indoors might be a really bad thing for the welfare of those particular animals. It might also be a bad thing for the health of those particular animals, in that they are all going to get flu, but it's easier to contain. So, animal welfare and pandemic prevention can sometimes pull apart." [INT25: Social Sciences | Josh Milburn]

b) MAIN SUGGESTION TO PREVENT FUTURE PANDEMICS

When asked to offer their main suggestion concerning how future pandemics can best be prevented, some respondents suggest reducing activities that intrude into wild animal reservoirs, as well as reducing the consumption of animal agriculture products. These suggestions directly address the linkages between animal welfare and pandemic prevention, as outlined in the previous section of this chapter.

Respondents also describe how their fields of work could play a part in the prevention of pandemics. Some suggest research into root causes as a way in which their field could contribute, while a few focus on preparedness measures. Furthermore, a few respondents suggest a need for interdisciplinary cooperation

1. Introduction to the topic

b) Main suggestion to prevent future pandemics

and an interdisciplinary approach to creating policies. Finally, an economic argument for the prevention of pandemics is also made by a few respondents.

Suggestions for addressing the potential root causes of pandemics were quite broad because many possible interfaces between wild animals and humans exist in different industries and processes, such as deforestation, urbanization and agriculture.

"The key is to control the detrimental impacts that we have on the environment; that alters the probability of contact and contagion between human and wildlife. All the activities of environmental alteration that put us in additional contact with wildlife or put our livestock in contact with wildlife or put us in a position to directly manipulate wildlife – all of these things have to be controlled. [...] Reducing any direct contact with wildlife, for example, would reduce the risk of pathogen transmission, along with having appropriate biological and veterinary monitoring when there are conditions for animal contact and manipulations. [...] If you want to prevent risk, you also need to reduce your consumption of animal products. [...] And I am particularly referring to the developed world." [INT07: Environment/Climate | Moreno di Marco]

"From environmental degradation to wildlife trade and consumption, rapid urbanization, deforestation, land-use change and, of course, climate change – we need to tackle all these drivers, and it's easier said than done." [INT19: Health | Renzo Guinto]

"The best thing to do to prevent or reduce the burden of future pandemics is try to alter human behavior and try to leave nature alone." [INT01: Health | Ghazi Kayali]

"A lot of the viruses or infectious disease agents that jump from one side to the other are very much linked to how we interact with animals and nature, and also between ourselves. So I think that's something that really needs to be part of a new preventative approach." [INT29: Animal Welfare | Rebeca García Pinillos]

Despite there being so many possible interfaces between human industries and animals to address, the need to shift human diets away from animal products and towards a more plant-based diet is expressed sporadically as an important factor in reducing the potential for zoonotic outbreaks. Respondents feel that animal agriculture's dual threat to humans to incur zoonotic diseases directly from farm animals and indirectly due to agricultural encroachment on wild animal habitats can be counteracted by a change in diet.

Moreover, a shift in diet is seen as a multi-faceted solution to address other themes brought up in the previous section, such as pathogen resistance to antibiotics. The shift to a more plant-based diet is hereby seen as a mechanism to reduce the absolute number of antibiotics given to animals.

"My understanding is that there's an intimate link between industrialized intensified animal agriculture and zoonotic disease. This arises both from having large numbers of animals together in intensified forms of production (and the fact that humans have to constantly interact with this large number of animals), but is also about the way that animal agriculture has encroached upon wild animal habitats and is constantly bringing human societies into contact with wild animal

1. Introduction to the topic

b) Main suggestion to prevent future pandemics

communities, which also becomes a source of zoonotic disease. And that can happen through the food supply but also the interaction. From that standpoint, we need to have a conversation about how we reduce the intensity of animal agriculture, but perhaps also, how we move away from intensified animal agriculture.” [INT09: Social Sciences | Dinesh Wadiwel]

“Let’s take the example of factory farming, mass livestock farms on an industrial scale. We know that this is directly and indirectly promoting epidemics [...] and it promotes the use of antibiotics.” [INT10: Nutrition&Food | Kurt Schmidinger]

OPPORTUNITIES FOR DIFFERENT FIELDS TO CONTRIBUTE TO PANDEMIC PREVENTION

Respondents represent a multitude of professional fields and therefore have different foci when it comes to the issue of pandemic prevention. Respondents thus indicate various opportunities for their different professional fields to aid in pandemic prevention. A popular theme here is research into the root cause of pandemics, which is brought forth by some respondents. Improving preparedness measures such as vaccinations, disease research and the strengthening biodiversity in nature systems are also indicated by a few respondents.

“Getting a better understanding of all the viruses that are out there and which viruses pose the most risk to humans. [...] This enables your governments and scientific institutions to better prepare, through policy or funding, to better target dollars to be better prepared if there is a pandemic. (This can happen) either geographically or based on certain animals that need to be surveilled for certain diseases, or improving even human public health on the preparedness side or even on the vaccine development side.” [INT02: Animal Health | Jim Desmond]

“Most likely, the virus came from an animal reservoir. When we study the viruses in the animals, even though they are the ones that are not potentially posing or can cause pandemics, we generate genomic data, sequence data, so that when a pandemic virus appears, we can at least identify that potential source. And when you identify the potential source, you can potentially prevent cases from spreading.” [INT01: Health | Ghazi Kayali]

“The more biodiversity a system uses, the more birds, trees, animals or insects are there in a given forest, the more resilient it is. The more you simplify the ecosystem or the environment, (the higher the risk that) a pathogen will be leaked to humans.” [INT21]

A NEED FOR INTERDISCIPLINARY COOPERATION AND COHESIVE POLICIES

The desire for better cooperation between professional fields was tangible during the interview process. This need is expressed by a few respondents as a reaction to the perceived complexity of pandemic prevention and the understanding that siloed work alone will be insufficient for providing wholesale solutions.

A further theme is that widespread and overarching support for pandemic prevention policy and action is seen as conducive to success. Respondents feel that solutions ideated in an interdisciplinary fashion were more suitable in addressing a wide range of needs and reduce the risk of running into blind spots.

1. Introduction to the topic b) Main suggestion to prevent future pandemics

Additionally, interdisciplinary policy is considered more effective in considering the general public's multi-faceted needs, thus raising compliance with pandemic prevention measures.

Finally, the need for science and research prescriptions to be accurately translated into policy solutions is expressed by respondents.

"If we just focus on the public health side and neglect the animal health side, then the problem or the virus or the pathogen would continue to exist in the animal population in your country and then eventually you always have the risk. But if you work together with human health people and the animal health people and work together and define a good policy that reduces the burden of disease in most populations, then everyone wins." [INT01: Health | Ghazi Kayali]

"Convincing the general public, convincing policy-makers, or coming up with ways that we can resolve these threats without too much impact on people's lives; I think that sometimes, when people hear about these kinds of threats, they worry that it means we need to change everything. The stereotype of the kind of green policy of 'we can't drive anymore, we can't use electricity anymore, we all have to grow our own food' or something like that. Now, certainly, I think those would be in many ways positive policy proscriptions, but the reality is that they're going to be a very, very hard to sell. So, I think that (it's important to work on) convincing people, working out ways to convince people, but also coming up with clever policy ideas." [INT25: Social Sciences | Josh Milburn]

"We need to stop destroying our forests. We need to change the way we consume our meat, for instance. We need to address climate change and decarbonize the world because it will be good for the prevention of future pandemics. We need to have a very clear and powerful argument. And we also need to forge new alliances with other sectors." [INT19: Health | Renzo Guinto]

"We can take actions and put in place policies as best as we can, knowing the potential risk factors to mitigate risks. I don't think it's possible to say we can prevent the next pandemic, given that we don't know what the vector of infection will be, where this will take place, geographically. We can make educated guesses about what issue areas and what aspects of current practices and policy increase the potential risk of pandemics, and we can work to mitigate that." [INT23: Law | Jan Dutkiewicz]

ECONOMIC ARGUMENT FOR THE PREVENTION OF PANDEMICS

The need to draw attention to the high economic costs of dealing with COVID-19 and other diseases is highlighted as a potential vehicle to rally public support behind pandemic prevention, as is indicated very sporadically by respondents.

The argument reads that the economic costs of addressing outcomes of pandemics far outweigh the costs of preventative measures or changing flawed human behaviors that benefit the spread of disease. However, it is described that a lack of knowledge throughout the general public in terms of understanding how zoonotic pandemics occur also needs to be addressed.

2. One Health

a) General knowledge of One Health

"It makes a lot of sense economically to question certain systems. That's my credo. I want us to learn from this, not only to fight the symptoms and then complain when the next pandemic comes over us, pretending these are natural catastrophes. When you ask people, the perception is that it is not caused by us, it just happens somehow and is part of nature. But this is not the case"
[INT10: Nutrition&Food | Kurt Schmidinger]

2. ONE HEALTH

'One Health' is a concept described by the World Health Organization "to designing and implementing programs, policies, legislation and research in which multiple sectors communicate and work together to achieve better public health outcomes. The areas of work in which a One Health approach is particularly relevant include food safety, the control of zoonoses (diseases that can spread between animals and humans, such as flu, rabies and Rift Valley Fever), and combatting antibiotic resistance (when bacteria change after being exposed to antibiotics and become more difficult to treat)." (World Health Organization, 2017) The One Health approach has been embraced by a variety of meaningful and influential political actors as a guideline for improving both global and national public health approaches, including the G20 since the Hamburg summit in 2017.

It is therefore unsurprising that "One Health" is a very familiar concept for the respondents. However, there are some differing opinions of the concept, surrounding whether it is holistic or rather anthropocentric. This chapter will therefore explore potential factors that influence this split and present criticisms of One Health, arguments in favor of the concept and the perceived hindrances to its implementation.

a) GENERAL KNOWLEDGE OF ONE HEALTH

Generally, respondents had heard of One Health prior to the interview, despite having a variety of different professional backgrounds. There are varying degrees of familiarity with the concept, as a number of respondents had implemented One Health or worked with it closely, while others indicated that they were familiar with the concept prior to the interview, albeit they perhaps weren't as familiar with it as the previous group. Finally, one interviewee was not familiar with One Health.

In order to provide a foundation for the following discussion, a brief paragraph outlining the concept of One Health was sent to the respondents prior to the interview, as well as being read to them during the interview.

2. One Health

b) Varying assessment of One Health: Anthropocentric or Holistic?

One Health: The interconnection between humans, animals and the environment has been acknowledged in the One Health approach supported by the OIE, FAO and WHO. The One Health approach addresses the interrelationship of health aspects. Solutions for dealing with the consequences of the virus and the political response to it have underlined the importance of holistic efforts.

b) VARYING ASSESSMENT OF ONE HEALTH: ANTHROPOCENTRIC OR HOLISTIC?

During the interviews, a rift in the assessment of the concept became clear. Some respondents criticize One Health as not being sufficiently holistic, as they feel that it mainly focuses on human health aspects. They think that the concept is anthropocentric in nature, leading to various flaws and blind spots, including the neglect of health and welfare relating to animals, as well as the environment. However, some respondents also state the opposite, namely that the concept is in fact holistic in nature.

Again, central to this difference seems to be the relationship with the concept, whereby typically those that had worked with One Health or adhered to the WHO definition of the concept were positive about it, while others were more critical.

It is noticeable that respondents who indicate a holistic understanding of the One Health concept often subscribe to the WHO definition of health, which reads broadly. Furthermore, they have typically worked closely with the concept themselves.

"When you go to the definition of health, as outlined by the WHO, it's described in a very broad way. It's more than the absence of disease. It's the mental and social well-being." [INT19: Health / Renzo Guinto]

"The interconnectedness, interdependence of human, animal, and the environment, form the basic principles of the One Health concept." [INT18: Animal Health / Nitish Debnath]

Others associate One Health with other concepts that may be more common in their specific field of work. Being accustomed to a different concept could lead to a respondent having a varying assessment of One Health.

"Within the industrial animal production context, the One Health concept does not come up frequently [...] The concept here is biosecurity. And people talk a lot about biosecurity and the biosecurity of operations. But the biosecurity paradigm is very different from the One Health paradigm because it doesn't foreground health; it foregrounds raw risk mitigation." [INT23: Law / Jan Dutkiewicz]

"IFOAM is the umbrella organization of (organic standards) [...] It issues principles such as fairness etc. This could be translated, one to one, into their approach. It is about the inseparable unity of humans, animals and environment." [INT15]

2. One Health

b) Varying assessment of One Health: Anthropocentric or Holistic?

Here are some arguments describing One Health as being strongly centered around human health and claiming that it neglects the health of the environment and animals.

"My understanding, looking at the One Health initiative, is that it is often now focused on how we safeguard human populations from zoonotic disease arising from the interaction with those systems. It isn't necessarily interested in what's happening to those animals or how we safeguard the welfare of animals in those systems." [INT09: Social Sciences | Dinesh Wadiwel]

"It's really about: human health and how animals and the environment are having a flourishing environment is important for human health, and how having diseased animals is bad for human health. But there's not so much about how humans affect the health of other animals. It seems to be primarily skewed towards prioritizing and thinking about One Health from the perspective of humans." [INT13: Social Sciences | Angie Pepper]

- Very sporadically respondents indicate that the concept postulates the insulation of humans and human behaviors or processes from natural ecosystems. Respondents argue that such insulation is neither reflected in reality nor beneficial to the goals of the approach, as there is a strong interrelationship between the different actors and systems. This notion also indicates that the concept is limited in terms of pandemic prevention because human behavior remains unchallenged and the root causes of pandemics remain unaddressed.

"The application of the One Health principles at least should have told us that we should have been planning well in advance for this reality and securing human populations from zoonotic disease, right? This is a failure in that respect. [...] I think we have a generalized sense of insulation from our food supply in our societies. [...] People don't expect to have to deal with the reality of what is happening with animal agriculture." [INT09: Social Sciences | Dinesh Wadiwel]

"This is my reading of One Health: It considers animal health much more within existing systems, wherein animals are used instrumentally for human ends; we are thinking of the health of livestock. We are not thinking of the health of the bats from which diseases may have originated." [INT23: Law | Jan Dutkiewicz]

Some arguments supporting One Health as especially holistic regarding its interdisciplinary outlook are detailed below.

- The concept was mainly said to address the interrelation of systems and industries, as well as creating awareness for their impacts on one another, especially regarding animal agriculture.
- Another argument for One Health's holism is that it is said to encompass various fields and sciences, especially relating to prevention, preparedness and response to pandemics. This offers a broad perspective that is strongly needed to break up the siloed nature of fields relating to pandemic prevention.

2. One Health

c) Hindrances to implementation

"The advantage is that we need to have a holistic approach. And the paradigm of sciences is that we always strip things down to even smaller parts in order to better understand them. And we do this on the assumption (it would help us) to better understand the overall system, but we often end up in a dead-end street because putting the pieces together to their whole doesn't happen. Scientists go into details, which are, of course, very exciting and which contribute to an explanation. But we mostly neglect the overall picture. And the One Health concept picks up exactly this." [INT15]

"The One Health formulation is good in that sense; is it is very explicit about the need for integration and the fact that we can no longer think of a world in which you can act in isolation. So, for example, you have your biodiversity objectives and then you have food production objectives and then you have your health objectives. There is no such thing as siloes in socio-economic development. All these things are linked with each other, and you need to take into consideration the consequences that your action for achieving one of these objectives can take over the achievement of other objectives. That is what I like about One Health." [INT07: Environment/Climate | Moreno di Marco]

"A collaborative approach is essential to break the current silos, and without doing that, the transformation we want to make will not be possible. When I talk about One Health, I also mean harnessing the creative power of diversity – diversity of different professions, diversity of the societies and above all, diversity of the individual countries around the globe and their engagement with their own strength in solving the complex problem. You'll have to make an approach whereby you can make a transformation of the current practice. And that has got to include prevention and preparedness, detection and, of course, response." [INT18: Animal Health | Nitish Debnath]

"I thought, at that time, that this problem cannot be solved by one particular professional, or one group of people, because there is a strong interface issue, and it has to be dealt with using an integrated approach. That is how I got involved with the One Health approach, concept and understanding." [INT18: Animal Health | Nitish Debnath]

- Finally, one respondent indicated that One Health takes into consideration the special contexts of developing countries. These countries face different challenges that need to be addressed simultaneously. Therefore, the concept was deemed to be holistic as it took into account the different contexts of implementation.

"If you try to improve animal welfare, ignoring that the people in some low-income country also have problems, you won't go very far. We need to tackle human welfare and animal welfare together to achieve sustainable progress. I see One Health as helping to move in a more sustainable direction because it tackles the complexity of the problems instead of single parts of the problems." [INT25: Social Sciences | Josh Milburn]

c) HINDRANCES TO IMPLEMENTATION

Respondents highlight that various factors impede the implementation of One Health. These factors can be categorized into economic reasons and special interests, the siloed nature of the different fields within One Health and siloed government structures, a lack of knowledge and a lack of funding.

2. One Health c) Hindrances to implementation

ECONOMIC REASONS AND SPECIAL INTERESTS

Respondents frequently indicate that economic factors were a hindrance to the implementation of One Health, given that it is not always profitable.

"The biggest obstacle is economics and economic benefit. Even though many people have proposed brilliant new approaches and revived traditional ones that led to better outcomes, the ultimate obstacle remains the enormous economic benefits that humans derive from exploiting and killing other animals, primarily in the food industry." [INT16: Social Sciences | Natalie Khazaal]

"The big problem for us, as it is a big problem for anything, is capitalism. Anything that stands in the way of markets and economic development will always be a challenge." [INT13: Social Sciences | Angie Pepper]

"We know that economics and money can shape the discourse in terms of government behavior and policies." [INT19: Health | Renzo Guinto]

Some respondents feel that economic special interests are hindering the implementation of One Health and leading to a lack of political will to enact change.

Special interests such as deforestation and agriculture are described as lobbying to deter the implementation of the concept.

"There are economic interests behind practices such as deforestation or logging or agricultural development, and especially in some countries, a big part of their economy is associated with these activities. If you really want to promote a reduction in these activities that determine environmental change, then you need to think of a solution and an alternative to give, especially to those countries that are currently largely relying on the consumption of natural resources through those activities. The public, political and the social feasibility of those actions, I think, is a big uncertain point at the moment." [INT07: Environment/Climate | Moreno di Marco]

Lobby groups are also said to be closer to the policy processes than scientists.

"Now, politicians aren't necessarily basing their policies on scientific findings. Science is not consequently integrated into policy. So even if these findings were there, politics is still very influenced by various people who all have a vote and lobby groups who try to shape policies according to their interests. We (scientists) see the need to better incorporate environment and animal welfare into policies." [INT03: Nutrition&Food | Gesa Busch]

SILOED NATURE OF THE DIFFERENT FIELDS WITHIN ONE HEALTH AND SILOED GOVERNMENT STRUCTURES

As One Health is an overarching concept, this in itself may lead to difficulties. Especially because the different sciences may already be difficult to grasp individually, a coherent understanding of their linkages may be even more difficult to achieve.

2. One Health

c) Hindrances to implementation

Furthermore, the siloed and detail-oriented approach of science makes collaboration difficult. Working in an interdisciplinary fashion in sciences is hampered by the individual fields being structured and funded in a siloed manner. However, this could be broken up by a shift in focus towards interlinkages and focusing on the One Health concept, as well as introducing more integrated studies.

"I'm a scientist, and in this case, with all the tools and methods we have available, we are increasingly detail-focused [...] but we don't see its impact on the overall organism and the ecological system beyond it. I'm mostly missing that scientific findings are brought together." [INT15]

"When we do science, it's very difficult to cross disciplines. I work a lot with biological science, but if I want to work with social scientists like psychologists or sociologists or anthropologists to link, for example, the human factor and the animal factor, right now, our system of funding and support is organized in silos, like different compartments, and it's very difficult to cross the compartments. And I see this One Health as helping us to break those barriers and cross the compartment to say we all need to think about this problem together, instead of treating each one discipline or own little issue separately." [INT22: Animal Health | Jean-Loup Rault]

"The ministries of human health or environment are saying that we should break these walls and break these silos and have more integrated studies." [INT21]

Due to the broad nature of One Health, respondents experience the need for multiple (siloed) government agencies within a country to become active, which can be an impediment to implementation.

"The biggest problem is to get really high-level political support because I told you that you have two or three different ministries or three different heads, [...] ministers of health, ministers of environment, ministers of agriculture and so on." [INT01: Health | Ghazi Kayali]

"It is always a topic in science policy. We say that we need a more holistic approach, but if I look at what is happening in reality; there are individual efforts here and there, but those are just these ecologists, which try to refer to such principles. But overall, I'm skeptical that this approach will prevail and that, as a consequence, it will have an impact on decisions being made. As it is a question of science, funding, financial means which should also be provided." [INT15]

LACK OF KNOWLEDGE

Some respondents state that a lack of knowledge surrounding the risks of pandemics leads to a lack of political action being taken to implement One Health.

"If more and more pandemics of this kind happen, and maybe in the future, unfortunately, there will be much more contagious ones, if not much stronger and more lethal ones than COVID-19 - that is an existential threat; it is a civilizational threat. And I wonder if we can create a narrative that conveys that so that people and governments will be more mobilized" [INT19: Health | Renzo Guinto]



2. One Health c) Hindrances to implementation

*"Knowing that individuals understand that this is a big problem, that we need to continue to invest in it and making sure people have that understanding is a whole obstacle in and of itself because a lot of people may not want to take the time to understand something as important as this."
[INT06: Health | Syra Madad]*

Finally, a lack of knowledge about One Health on the part of governments leads to the concept being left out of policy.

*"One obstacle is probably that this concept of One Health is not that well known. There is also a lack of integration of the concept in policy measures, but COVID has probably given more opportunity to highlight One Health. It's not an unfamiliar concept to me, or to others. But it's not a recurring part of policies around large-scale animal agriculture or preventing pandemics."
[INT20: Environment/Climate | Mia MacDonald]*

LACK OF FUNDING

A few respondents highlight the need to better fund the implementation of One Health: although politicians pledge to implement the concept, funding is still lacking. Funding is similarly an issue in different fields of science.

"It was institutionalized. Once they did that, we start thinking about funding issues. But for most countries, we are still waiting for high-level political admittance to come through. And then, definitely, funding is always an issue. But that is the same for any problem" [INT01: Health | Ghazi Kayali]

"And as it is a question of science funding, financial means should also be provided." [INT15]

Moreover, funding is even more difficult to obtain in less wealthy countries.

"Being an economically poor country, on the ground, application is still very far away, in my opinion. It takes a lot to force something concrete." [INT21]

3. SCENARIOS: OVERVIEW

At the core of the future study is the discussion of three fictitious scenarios that might be part of an international agreement (“Pandemic treaty”) or institutional reform to combat future pandemics. While the scenarios were modeled after political proposals that are currently being debated, they were – for matters of practicality – not at all identical with actual policy projects, but clearly abridged and pointed when presented to the interviewees. The scenarios were fictitious because their purpose was not to test specific political initiatives but to encourage the experts’ assessments about possible paths of global health policy in the future. The scenarios read as follows:

- Scenario 1: “Symptom Control”

Nothing changes. The pandemic remains a global problem until vaccinations catch up with mutations of the virus - symptom control of the consequences of the pandemic instead of prevention. The measures focus on vaccination campaigns (e.g. including for minks) and monitoring of biosecurity. Animal welfare, biodiversity, climate change and ecological aspects are treated as marginal issues and not included in the pandemic debate. Animal welfare is not an aspect of the Sustainable Development Goals. Fur farms, factory farming and wildlife markets remain unchanged or even further isolate animals (biosecurity measures).

- Scenario 2: “Preparedness and Response”

Governments agree on international coordination to tackle future pandemics but decide to only focus on better preparedness and response rather than prevention (not tackling the root causes of zoonotic disease outbreaks). They will enable better collaboration, exchange of data and improve early detection and dedicate financial and technical resources to vaccine development. Minimal measures are taken on regulating zoonotic outbreak hotspots like live animal markets or establishing better disease monitoring for high-risk practices such as fur farms. Other species including farm animals are potentially further isolated to reduce their contact with pathogens and no action is taken to address habitat loss or expansion into ecotones.

- Scenario 3: “Prevention”

The focus is shifting from symptom control to real prevention of pandemics i.e. tackling the root causes of zoonotic disease outbreaks. International institutions call for a paradigm shift in the way humans treat animals and nature. The focus on technical solutions (e.g. in increasing biosecurity) is replaced by the realization that we need to restore the balance between the natural and human worlds. Fur farms are closed. Scenarios for phasing out factory farming are being developed and implemented at full speed and the consumption of animal products is increasingly replaced by plant-based alternatives and cultured meat. Live animal markets are banned/closed. Dog and cat meat trade and commercial wildlife trade are banned. Addressing human health issues is approached holistically and is interlinked with animal welfare and environmental protection. The One Welfare Framework is acknowledged as a guiding principle by international institutions. Animal welfare is a global priority and is integrated in the post 2030 Sustainable Development Goals.

4. Scenario 1: Symptom Control a) Effectiveness for Preventing Future Pandemics

Each scenario has a different focus and the scenarios differ depending on the “required change”. In this regard, the scenarios range from “no change required” (Scenario 1) to “a lot of change required” (Scenario 3).

Discussing the three scenarios should help to gain a better understanding of how effective and likely the experts perceive each scenario and to understand their reasoning regarding effectiveness and likelihood.

Additionally, for the most challenging scenario (Scenario 3) inhibiting factors for its realization and its implications for human well-being were also extensively discussed.

Because each interview left a lot of room for the respondents to express their views, the amount of time spent on each scenario varied from interview to interview. If throughout the interview too much time was spent on discussing other aspects, some questions and sometimes even scenarios – mostly Scenario 2 – were skipped.

4. SCENARIO 1: SYMPTOM CONTROL

The first scenario is called “Symptom Control” and it focuses on controlling the consequences of the pandemic by employing vaccination campaigns and monitoring of biosecurity.

“Nothing changes. The pandemic remains a global problem until vaccinations catch up with mutations of the virus - symptom control of the consequences of the pandemic instead of prevention. The measures focus on vaccination campaigns (e.g., including for minks) and monitoring of biosecurity. Animal welfare, biodiversity, climate change and ecological aspects are treated as marginal issues and not included in the pandemic debate. Animal welfare is not an aspect of the Sustainable Development Goals. Fur farms, factory farming and wildlife markets remain unchanged or even further isolate animals (biosecurity measures).”

The scenario is generally perceived as ineffective in preventing future pandemics. The likelihood of this scenario becoming part of an international agreement on pandemics is judged by the respondents to be moderate.

a) EFFECTIVENESS FOR PREVENTING FUTURE PANDEMICS

Scenario 1 is generally perceived – by nearly every respondent – as not being effective in preventing future pandemics.

4. Scenario 1: Symptom Control a) Effectiveness for Preventing Future Pandemics

(i) REASONS FOR NOT BEING EFFECTIVE

The majority of the experts clarify this by stressing that this scenario doesn't tackle the root causes of the pandemic: it is only reactive and doesn't address human behavior.

"If you're going to allow wildlife farming and if you're going to not address climate change, then you're going to continue to have these problems." [INT02: Animal Health | Jim Desmond]

- The respondents frequently mention that this scenario is only reactive to the current pandemic (symptom control) and doesn't have a long-term perspective. Even with the current pandemic and its mutating virus, this approach would only equate to playing catch-up. One respondent stresses that this scenario only tackles low-hanging fruits and makes the system feel safer without making substantial changes.

"Any type of scenario that is not proactive and is being reactive certainly puts you in a position of significant disadvantage. If I were to rate it, I would give it the lowest rating. You're constantly playing catch up." [INT06: Health | Syra Madad]

"All symptom control would achieve is respond to the current pandemic and then wait for the next one. That's basically what it appears like." [INT09: Social Sciences | Dinesh Wadiwel]

"And my worry is that – what you've called symptom control – is just fiddling at the edges. It's tackling some low-hanging fruit, or it's tweaking existing systems so that they are a little bit safer. Or if I'm being very cynical, they look or they feel a little bit safer without really making any substantial change." [INT25: Social Sciences | Josh Milburn]

- A few respondents mention that this scenario doesn't address human behavior (e.g. agricultural practices, urbanization or consumption of animals), which are at the root of the pandemic.

"Animal viruses jump species because of human behavior. Whether it is our agricultural practices, whether it is our heavy urbanization, whether it is our industrialization causing climate change. And our cultures as well, like consuming wild animals and similar practices. If we don't interfere, we are not going to prevent anything." [INT01: Health | Ghazi Kayali]

"The likelihood of the outbreak of a pandemic will increase if we deal with animals the way we are doing it now. But it is not the main reason for me to promote rethinking about animal husbandry or agriculture." [INT12: Environment/Climate | Hanns Moshhammer]

Some of the experts stress that this scenario describes the status quo in which the public discourse focuses on vaccination while animal welfare, biodiversity, and climate change are only marginal issues, and hence "nothing changes".

"This is as effective as what we have been doing so far. And I would say we're being really ineffective so far. If we keep doing the same thing in the future, we will be very ineffective in the future." [INT07: Environment/Climate | Moreno di Marco]

4. Scenario 1: Symptom Control

b) Likelihood of being part of an international Agreement

"In some ways, this is the root of the problems: that development, health and everything beautiful are only seen as belonging to humans." [INT28: Animal Health | Natalia Cediel]

"The current situation is we are still in scenario 1. People are panicking about vaccines. Delta virus and, now, the Lambda are going around. And animal welfare, biodiversity, climate change are marginal issues that are of interest to only some of us, not the whole of the health sector. And not the whole of society in general." [INT19: Health | Renzo Guinto]

"I think that's what we're doing right now. That seems to be the status quo approach." [INT23: Law | Jan Dutkiewicz]

(ii) REASONS FOR BEING EFFECTIVE

Some of the experts see improvements with Scenario 1, e.g. regarding the importance of vaccination campaigns or improving biosecurity, while nonetheless some of them still don't perceive it as being sufficient.

"Just doing a little bit could already create a small improvement in view of the pandemic. It is at least one step; it's better than no effect at all." [INT11]

"All of these things – if they were actually taken seriously and implemented universally, which is a big question mark – might to a certain extent mitigate future risk, but they wouldn't address the root causes of the risk." [INT23: Law | Jan Dutkiewicz]

- Experts sporadically stress that vaccination campaigns are helpful, even though they are not sufficient.

"Of course. Vaccination campaigns have to be seen as positive when fighting a pandemic – that's in some way what we have at the moment – so it can contain the pandemic. But it only has an impact on the present pandemic." [INT03: Nutrition&Food | Gesa Busch]

"But the measures, the vaccinations – what you call symptom control – are of course reasonable secondary preventive measures. We do need them, because we will never be able to avoid pandemics and we never did avoid them yet. Symptom control is still necessary" [INT12: Environment/Climate | Hanns Moshhammer]

- In this context, one respondent mentions that biosecurity measures are helpful.

"In comparison, Hong Kong in 1996, when they had an outbreak of H5N1 in the humans and realized that it is coming from the birds in the live bird market, they introduced measures into the live bird markets. They banned some practices, they enhanced biosecurity. They were able to actually control the virus, and they didn't have the same problem again. So, there are things that you can do, but you really need to sustain it." [INT01: Health | Ghazi Kayali]

b) LIKELIHOOD OF BEING PART OF AN INTERNATIONAL AGREEMENT

Scenario 1 is perceived as being moderately likely: it ranks second after Scenario 2 and is seen as more likely than Scenario 3. Slightly more respondents perceive this scenario as being likely than being not likely.

4. Scenario 1: Symptom Control b) Likelihood of being part of an international Agreement

(i) LIKELY

Some respondents stress that this scenario is likely because it doesn't require a lot of change and is compatible with the current system, hence being fairly easy to agree to. This goes hand in hand with business interests benefiting from the status quo and other groups not pushing sufficiently strongly for change.

- Sporadically: Business interests favor such a scenario with only limited change.

"We have seen this clearly with the Corona outbreaks in the slaughterhouses, where it was said – in order to keep the economy going, everything needs to stay as it is. Those are big companies who don't have an interest in e.g. their employees going into home office or other things like that. There is a strong interest that nothing changes." [INT08: Social Sciences | Mieke Roscher]

"Not that I want it, but I'm assuming that this one is the most likely one. Because the other scenarios would require a stricter departure from the dominating common practices. It is the tables of capitalism. With the other scenarios you will stand up to people who profit from the current situation. And they will use all their power to keep the situation unchanged." [INT15]

"There is the influence of industry. But, I think, there is a degree of political apathy as well. There is political apathy among individual voters. Although voters, on the whole, are becoming more and more aware of these issues, I'm not sure it's going fast enough. So, I'm not sure that governments have the motivation to do something about this. But even at the government level, there is an awful lot of denial." [INT25: Social Sciences | Josh Milburn]

- Sporadically: This scenario doesn't challenge people to change, and hence it won't elicit a strong negative reaction.

"Nobody needs to change things, nothing needs to be prohibited or abolished: The fur farms can continue, wild animal markets would still be there, so there will be no resistance. Resistance is there, when you want to change things where people see their livelihood threatened or negative results are to be expected for people. So politically, this scenario is the easiest to get politicians to internationally agree on. We coordinate vaccine development, but otherwise, we don't change things." [INT03: Nutrition&Food | Gesa Busch]

A few respondents also argue that this scenario is likely because it focuses on human public health, which is easier to understand and relevant to many people and decision-makers.

"It's harder to convince people that the other things are as important. That thinking about animal health is important. They might not agree on how to spend the money on human public health, but they're definitely going to think that spending the money on human public health is more important than spending the money on doing surveillance in wildlife or addressing climate change." [INT02: Animal Health | Jim Desmond]

"Animal welfare, biodiversity and climate change are marginal issues that are of interest to only some of us, not the whole of the health sector. And not the whole of society in general. It's only our own small circles and bubbles that are looking into these matters. But again, the overall discourse is still around the immediate, the urgent, the vaccines." [INT19: Health | Renzo Guinto]

4. Scenario 1: Symptom Control c) Implications for animal welfare

(ii) NOT LIKELY

The main argument for perceiving this scenario as not likely – voiced by a few experts – addresses the notion that public and professional discussions are beyond this scenario and a more ambitious approach will be more likely.

‘I would like to think that people are much more sensitive at the moment to climate change and the future effects of climate change, which aren’t going to be in the distant future, with regard to health and biosecurity. I’m hopeful that there will be some changes, that it won’t just be business as usual. Or at least, there will be some pledge to make some changes.’ [INT13: Social Sciences / Angie Pepper]

“To me scenario one is not a goal. It’s, in a way, a missed opportunity. I would hope that we could at least take some steps towards preparedness, but again, it’s really not going to address the underlying problems, that’s just symptom management.” [INT24: Law / Ann Linder]

To the contrary, one respondent mentions that even Scenario 1 is too ambitious to be accomplished.

“I don’t think we are going to have any global policy that is going to be in force. We are going to talk about it and then we are going to forget about it until the next pandemic comes - because of the animosity in global politics.” [INT01: Health / Ghazi Kayali]

Another respondent stresses that the likelihood of the several scenarios differs depending on the region.

c) IMPLICATIONS FOR ANIMAL WELFARE

Regarding the implications for animal welfare, some respondents stress that Scenario 1 wouldn’t have any impact, because there would be no change.

“If animal welfare still won’t be part of the UN sustainable development goals, then it won’t stop changes that are already under way for improvements or animal welfare, but it won’t give them any enhancement, so animal welfare would have no consideration here.” [INT03: Nutrition&Food / Gesa Busch]

“Not in this context. The animal welfare debate is more driven by social pressure, where animal welfare as such is demanded. And it is not linked with pandemics. The topic of animal welfare as such is rather a topic of its own and it won’t play an important role with respect to symptom control.” [INT15]

Several negative implications were mentioned, although most of them were only mentioned by a single respondent each:

- Increasing biosecurity decreases animal welfare.

“The animal welfare impact could actually be negative. So that goes back to my points about closed-system farming, for example, or indoor farming. These are sometimes things that are presented as good for human health. Yet, they are at the same time obviously very bad for animal

4. Scenario 1: Symptom Control d) Implications for human well-being

welfare. There are existing models of extremely closed system animal agriculture. Which are atrocious for animals, but may be quite good for human health, insofar as any animal agriculture is good for human health." [INT25: Social Sciences | Josh Milburn]

- More animals would have to be culled in case of a pandemic.

"Especially this strategy means that increasingly more animal stocks have to be culled, because the vaccination strategy is impossible to implemented in world trade; you can see for example with the classic swine flu. There are import restrictions, for instance in China." [INT04: Animal Health | Michael Marahrens]

- With the continuing intensification of animal agriculture, animal welfare declines.

"We are in the midst of a long process of increasing intensification of industrial animal agriculture. So, continuing with the status quo leads inevitably to worse animal welfare outcomes because of this growing intensification, which increases the number of animals used, contained and slaughtered every year. So, if we don't do anything, they're just going to continue to get worse. For me, COVID-19 presented the opportunity for us to have a conversation. And if we don't have this conversation, then, inevitably, long-term, we're going to continue the intensification of animal agriculture and then welfare outcomes will be poorer for animals" [INT09: Social Sciences | Dinesh Wadiwel]

d) IMPLICATIONS FOR HUMAN WELL-BEING

In the interviews, there was hardly any discussion about the implications of Scenario 1 for human well-being that went beyond the effectiveness of this scenario for preventing future pandemics.

5. SCENARIO 2: PREPAREDNESS AND RESPONSE

The second scenario is called "Preparedness and Response" and it focuses on international collaboration and small measures regulating zoonotic outbreak hotspots.

"Governments agree on international coordination to tackle future pandemics but decide to only focus on better preparedness and response rather than prevention (not tackling the root causes of zoonotic disease outbreaks). They will enable better collaboration, exchange of data and improve early detection and dedicate financial and technical resources to vaccine development. Minimal measures are taken on regulating zoonotic outbreak hotspots like live animal markets or establishing better disease monitoring for high-risk practices such as fur farms. Other species including farm animals are potentially further isolated to reduce their contact with pathogens and no action is taken to address habitat loss or expansion into ecotones."

This scenario is perceived as being more effective than Scenario 1 but less effective than Scenario 3 for preventing future pandemics. Regarding the

5. Scenario 2: Preparedness and Response

a) Effectiveness for Preventing Future Pandemics

likelihood of being part of an international agreement on pandemics, this scenario is seen as most likely.

a) EFFECTIVENESS FOR PREVENTING FUTURE PANDEMICS

Overall, Scenario 2 is perceived as being more effective than Scenario 1 but less effective than Scenario 3 in preventing future pandemics. Its effectiveness is mainly explained by reducing future outbreaks and improving early responses, while the criticism focuses on failing to address root causes.

"[Scenario 2 would be] marginally more effective than the first scenario. But, I still think, quite ineffective in terms of preventing pandemics. As a global community, we have missed the point of trying to address the root causes, and also to change the relationship with the nonhuman world."
[INT20: Environment/Climate | Mia MacDonald]

"Human beings like to achieve short term benefits. In that sense, Scenario 2 will be in the middle. Scenario 3, of course, will be the best, but it's unrealistic that we can achieve it as mankind."
[INT21]

(i) REASONS FOR BEING EFFECTIVE

Approximately half of the respondents voice arguments on why this scenario would contribute to the prevention of pandemics. The two most commonly-used arguments stress that this scenario improves early responses to pandemics and reduces future outbreaks.

Its effectiveness is frequently illustrated with the improvement of early responses to pandemics, e.g. through information sharing and vaccine development.

"There's more international collaboration exchanging data and developing vaccines and financial resources made available." [INT03: Nutrition&Food | Gesa Busch]

"In my opinion, what has actually worked very well was the disclosure of the genetic code of the virus. And the same applies to the production of vaccines." [INT12: Environment/Climate | Hanns Moshhammer]

"Scenario 2 would definitely enhance further our preparedness for pandemics. It's likely that if we encounter another COVID-19, it will not be at the scale we see now, but it is not totally prevented. It will still happen, but maybe contained in one region in the world." [INT19: Health | Renzo Guinto]

It is also frequently mentioned that this scenario would reduce future outbreaks, e.g. through regulating hotspots like live animal markets and better monitoring.

"Here, only minimal measures are taken, but at least there are some measures taken, e.g. regarding live markets or high-risk practices. At least there is some regulation." [INT03: Nutrition&Food | Gesa Busch]

5. Scenario 2: Preparedness and Response

a) Effectiveness for Preventing Future Pandemics

"This one includes better risk regulation of particularly high-risk activity. Certainly that would help. If we had better guardrails in place, from a policy perspective, to regulate wildlife farming, animal trade, live animal markets, these types of things that are known to have produced outbreaks in the past, certainly that would help." [INT24: Law | Ann Linder]

Two more aspects are mentioned sporadically to explain the effectiveness of the scenario for preventing future pandemics:

- This scenario would reduce the contact with pathogens by isolating animals.
- This scenario is more proactive.

"This scenario is getting more into the prevention. Right now, you're looking more at being proactive versus reactive. Anything that is getting us more in the direction of prevention instead of response is better in my eyes. Again, as I mentioned, it's not covering all the bases that you need for an effective preparedness strategy or response strategy, but it's only on its way." [INT06: Health | Syra Madad]

(ii) REASONS FOR NOT BEING EFFECTIVE

Approximately half the respondents explain why they don't perceive this scenario as being effective in preventing future pandemics.

The main reason for considering Scenario 2 as not being effective is that it doesn't address root causes and prevention. The scenario still allows intensive forms of animal agriculture and does not address the destruction of biodiversity and the exploitation of animals.

"So, we're going to still have intensive forms of animal agriculture and land clearing et cetera bringing humans increasingly in contact with potential sites of zoonotic disease. But you approach it with preparedness, so you're trying to catch zoonotic infections and contain them before they spread to a global population. So, this would bring, I guess, more control over that situation but it wouldn't necessarily stop a pandemic disease from being created, right?" [INT09: Social Sciences | Dinesh Wadiwel]

"It is not a scenario that avoids pandemics, but it is a scenario that better prepares us for pandemics. (In scenario 2,) we are not out for prevention. Scenario 2 is an optimal scenario, but it is a reactive and no preventive scenario." [INT12: Environment/Climate | Hanns Moshhammer]

"To not address the destruction of biodiversity, exploitation of animals, domestic and wild (and the use of antibiotics) would be, again, a failure and wouldn't really be sufficient in terms of preventing pandemics. Is it a bit better (than scenario 1)? Yes. But obviously, the root causes of any problem have to be honestly acknowledged and then addressed if you don't want to repeat, to some degree and with some variety, a similar scenario to what has already happened." [INT20: Environment/Climate | Mia MacDonald]

"As far as scenario two goes, preparedness can only get you so far, and that's always going to be much more expensive than prevention. Because trying to clean up something like COVID on the backend, from an economic standpoint, is always going to cost much more than doing the hard

5. Scenario 2: Preparedness and Response

b) Likelihood of being part of an international Agreement

work ahead of time. It is the same with preventative medicine. It's much easier to address something before it becomes a problem." [INT24: Law | Ann Linder]

Aside from this overall criticism, other aspects are additionally voiced, albeit mainly by a single respondent:

- More international cooperation and aid for disadvantaged countries would be necessary, but that doesn't seem likely.

"I would rather wish for more cooperation and more international agreements with respect to particular hotspots. This does make sense. I am sure, though, that many countries will not participate in this, because they consider this as being an interference with their internal affairs. And because there is much mistrust between the states – America and China, or America and Europe." [INT12: Environment/Climate | Hanns Moshhammer]

- The indigenous perspective is missing in the scenario.

"It will definitely be more effective than scenario 1, but then again, in those documents that you've sent, I don't see where indigenous worldviews are included. It's pretty much relying on western science to try to implement some sort of preparedness plan. But it's totally lacking the indigenous knowledge system." [INT26: Social Sciences | Susan Chiblow]

- Animal welfare isn't at the core of preventing pandemics.

"Both scenarios are reactive. They don't avoid pandemics. But it is quite natural that we can't avoid pandemics. We can reduce the risk, but animal welfare alone contributes to this only to a lesser extent. Refraining from animal husbandry and feeding all humans vegetarian or vegan is not realistic. And even if I did so, I would not be able to avoid pandemics completely." [INT12: Environment/Climate | Hanns Moshhammer]

- International collaboration would lead to data protection issues.

"I see it similarly to the first Scenario, with the additional threat of constructing a massive data network and increasing the problematic aspect of data exchange." [INT14: Environment/Climate | Helga Kromp-Kolb]

b) LIKELIHOOD OF BEING PART OF AN INTERNATIONAL AGREEMENT

Overall, Scenario 2 is perceived as being the most likely scenario in terms of being part of an international agreement on pandemics.

"I think, the likeliest scenario is a mix between two and three, more oriented to two with some elements of three." [INT17: Economics | Martina Bozzola]

"1 is not enough, and 3 would be very painful for the government or maybe not practical for them; it will have huge challenges. 2, I think, is the middle ground optimum." [INT21]

5. Scenario 2: Preparedness and Response

b) Likelihood of being part of an international Agreement

(i) LIKELY

Respondents stress that Scenario 2 covers the middle ground between Scenario 1 and Scenario 3: better preparedness and response is seen as necessary, but the major transformation of Scenario 3 is seen as highly unlikely.

"Once the pandemic is over and we sit and start doing our evaluations and our action reports, we will eventually come up with new guidelines for at least pandemic preparedness and response. We have to go back, start from scratch, issue new guidelines, and then have everyone develop their own preparedness plan and their own preparedness infrastructures. That is going to happen. But then, still, the prevention aspect remains the hardest and remains the one that needs the highest political wealth. And it remains the one that is going to have the most drastic effect on how we live our lives today. So, I don't think that is going to happen any time." [INT01: Health | Ghazi Kayali]

"I think scenario 2 is the most likely one, because I think we do need to do something, but not go too far. I don't think we can say that we don't need to change anything. You cannot say that everything is good, so some measures will be taken, which will mostly go in this direction, because they will establish the current strategies and won't really redirect things." [INT11]

"Scenario 1 is a scenario with no imagination, no inspiration; it's not driven by any kind of anger. Scenario 2 is more along the lines of 'okay, let's make some changes, but we don't want to be too disruptive'. And the focus is really about pandemics alone. It's not really risk prevention; it's merely risk mitigation. I think what is assumptive there is that we will just prepare our health system to be able to respond when pandemics occur and that we will just minimize contact between animals and humans so there will be a much lower spillover risk." [INT19: Health | Renzo Guinto]

Some perceive it as likely because it is realistic and addresses measures that are currently being discussed by governments.

"From a policy perspective, I think that this is most likely where we are going because this is about preparedness and response and not much about prevention. That's what I can see, at least at the moment: things like surveillance and monitoring and preparedness and then recovery and response. I am seeing a lot of this language being used much more than any language about prevention. In that sense, it is definitely more effective than the previous one, but again, the effectiveness is still low." [INT07: Environment/Climate | Moreno di Marco]

"I don't see it as completely utopic that at least parts of this scenario become a reality, at least concerning the first part of it. Cooperation amongst the parties can definitely become a reality, improved data exchange etc.; and to monitor live animal markets and such actions is, I think, a quite realistic scenario." [INT08: Social Sciences | Mieke Roscher]

Some mention that it doesn't challenge the status quo, leaves economic interests untouched and is generally less demanding regarding animal welfare.

"It doesn't affect the current status quo of industries such as the livestock production and deforestation. This scenario doesn't go in the direction of reducing risk factors. It just goes in the direction of better monitoring. It's an easier one to accept for a lot of actors, because it doesn't start from a change in the current socio-economic activities. It just adds an additional element. Let's keep deforesting, let's keep using wildlife, let's keep using livestock, but at the same time

5. Scenario 2: Preparedness and Response

b) Likelihood of being part of an international Agreement

let's do some more monitoring of the consequences of these activities." [INT07: Environment/Climate | Moreno di Marco]

"It is less demanding with regard to animal welfare. It essentially allows people to carry on treating animals as they do, more or less, but it introduces measures that will allow them to do that whilst also putting up some of the safeguards to protect human health. It allows people to carry on doing what they're already doing." [INT13: Social Sciences | Angie Pepper]

"The agricultural industry might find the idea of further isolating farm animals very attractive. They will have big production sites that can also avoid animal transport and reduce contact with animals from other production sites. And these giant stables will be strictly isolated. I can well imagine that this is an option, which will be feasible and interesting for the agricultural industry, while maintaining the current interests of profit and increasing centralization. And this might possibly reduce the development of diseases. But of course, it would absolutely not lead to improved husbandry conditions, perhaps with the exception that animal transports are reduced." [INT27: Health | Imke Lührs]

(ii) NOT LIKELY/INHIBITING THE PROCESS

Several aspects are mentioned explaining why this scenario is unlikely. Common among those arguments is the understanding that Scenario 2 requires more change than Scenario 1 and would therefore be much more difficult to realize.

"This concept is partly about system reconstruction. And this is always inconvenient, unpopular. I could also draw many parallels to the climate crisis. And the COVID crisis is a missed chance for contributing to measures against the climate crisis." [INT15]

However, each aspect is only mentioned sporadically by two respondents or a single person:

- This scenario would go against interests of groups or individuals and there isn't sufficient political will to overcome these interests.

"And there are not only national self-interests, but also individual interests of interest groups such as the pharmaceutical industry or trade, tourism, agriculture. And they will insist on their interests: we have suffered from lockdown for so and so long and now we have to catch up. And politicians will listen to them." [INT12: Environment/Climate | Hanns Moshhammer]

- This scenario would mean more international collaboration – which is unlikely.

"I find scenario 2 much more desirable than scenario 1, but it is less likely. We have seen how the countries reacted. Each of them has gone their own way. They have closed the borders. And they hoarded all things, such as vaccines, masks etc. and only distributed them later on, like breadcrumbs. Everybody blamed the other. And if all sorrows are gone and they are driven by partial interests, they will be even less willing to cooperate." [INT12: Environment/Climate | Hanns Moshhammer]

- This scenario would be more costly than Scenario 1.

5. Scenario 2: Preparedness and Response

c) Ways for promoting/Advancing this scenario

"You need financial and technical resources, you need bureaucratic bodies, you need people actually doing this and perhaps development of know-how, technical expertise and so on. So the question is: Can you expect countries to equally contribute and equally carry out the mandate of this? I don't think scenario 2 is much different from scenario 1 in terms of government willingness to agree to the basic tenets of this scenario; I just wonder about implementation." [INT23: Law | Jan Dutkiewicz]

- The implementation of the agreement appears unclear, especially considering that the situation of e.g. live animal markets strongly differs among various regions of the world.

"For live markets, there are internationally big differences as to how relevant this would be. In Europe, that is not very relevant in every-day life, because where do you even have that. So, different countries would come into [the debate] with different interests. If Germany says, 'yes, let's regulate live markets,' then in other countries in Asia, where [these markets are] part of everyday life and also of the culture, there would be resistance. This makes agreements hard and leads to minimalistic standards with no real improvements." [INT03: Nutrition&Food | Gesa Busch]

"These things depend on a number of factors: they depend on the actual desire to do these things; they depend on people actually implementing things they agree to; they depend on state capacity, how much resources a given state is capable of investing into keeping his end of the bargain in terms of investing in research, in monitoring, in communication staff. All these things cost money; all these things imply having bureaucracies in place that do this. The question is, would there be a central international monitoring body? Would this go to the WHO? Would the WHO be the touchstone organization through which we would monitor these various national level monitoring communications schemes? Where would the money come from? There are all kinds of logistical questions of how this would be implemented." [INT23: Law | Jan Dutkiewicz]

- Societies are no longer interested in addressing the origin of the pandemic.

"I worry a bit because the pandemic has gone on for so long that some of the lessons- (for example,) there was some media reporting in the earlier months of the pandemic around the source of this virus and how it links to the ways we engage with animals – I think some of that information has probably receded even on the public's mind." [INT20: Environment/Climate | Mia MacDonald]

c) WAYS FOR PROMOTING/ADVANCING THIS SCENARIO

Respondents also sporadically suggest ways for promoting this scenario, although each suggestion is only mentioned by a single respondent.

- Prevention could save money in the long run.

"The cost of COVID-19 to governments everywhere has been astonishing. The impact has been significant and the cost to governments, particularly in terms of transfers to individuals and companies to support them during this effectively forced recession, this has been huge. So, it's surprising to me that there isn't more of an appetite for finding solutions to prevent this from happening again." [INT09: Social Sciences | Dinesh Wadiwel]

5. Scenario 2: Preparedness and Response

d) Implications for animal welfare

- Bureaucracy would be needed to control this agreement.

"I would say there would be a centralized bureaucracy that coordinates the various national levels. You couldn't just leave this to international countries to, multilaterally or, in some cases, bilaterally, address these issues; you would need an international body that would set the standards and coordinate these monitoring and data exchange and communication and early detection efforts." [INT23: Law | Jan Dutkiewicz]

- Financial support for poorer countries would be needed.

"And you would absolutely need funding assistance, presumably via a body like the WHO or the UN, for countries not able to dedicate resources, be it countries that are poor or countries that don't have the technical expertise or the infrastructures to do this. It would require not just international coordination, but international aid to countries less able to perform these tasks." [INT23: Law | Jan Dutkiewicz]

d) IMPLICATIONS FOR ANIMAL WELFARE

When discussing Scenario 2, the implications for animal welfare played a stronger role compared to Scenario 1. However, the respondents frequently stated that this scenario doesn't have an impact on animal welfare because it doesn't change the way in which animals are being seen and used.

"There seems to be some better control and some more biosecurity. This goes in the direction of at least checking early-warning signals. And they can even prevent some of these outbreaks from becoming pandemic, but I cannot read anything about changing the way in which we interfere with the animal community, be it wildlife or livestock." [INT07: Environment/Climate | Moreno di Marco]

"If you prohibit or restrict live animal markets, it doesn't mean that the very fragile human to wild animal relationship would be fundamentally questioned or changed. It just means that certain niches may be closed. So, fur farms would be monitored and such - that's not a fundamental change." [INT08: Social Sciences | Mieke Roscher]

"It is less demanding with regard to animal welfare. It essentially allows people to carry on treating animals as they do, more or less, but it introduces measures that will allow them to do that whilst also putting up some of the safeguards to protect human health." [INT13: Social Sciences | Angie Pepper]

Positive implications for animal welfare are only mentioned sporadically. The assumption is that (disease) monitoring might lead to improvements over time.

"I think, over time, there could be some improvement in animal welfare. Once you put surveillance systems into place, then, of course, the goal would be to reduce risks. Once you have a database of diseases and risks and the like, then, that would generally start to improve animal welfare, because one of the ways you would reduce risk, I think, would be to improve the animal welfare situation of the animals, that are being farmed." [INT02: Animal Health | Jim Desmond]

5. Scenario 2: Preparedness and Response

e) Implications for human well-being

Similarly negative aspects are also only mentioned sporadically. The increased biosecurity mentioned in this scenario might lead to the isolation of animals, which would further reduce animal welfare.

"Animal welfare is not improved at all in this scenario, rather the opposite is the case, farm animals would stay isolated, which means the containment in closed stables, so animal welfare is completely disregarded here. It serves the protection from viruses, but animal health, depending on how you define this, on the whole would be negatively impacted." [INT03: Nutrition&Food | Gesa Busch]

"There's also a scope for animal welfare outcomes to actually get worse if certain forms of intensified animal agriculture, which have poor welfare outcomes, are deemed safer in terms of safeguarding human populations from zoonotic disease." [INT09: Social Sciences | Dinesh Wadiwel]

e) IMPLICATIONS FOR HUMAN WELL-BEING

Some respondents also address positive aspects for human well-being. However, most of these aspects were already mentioned when discussing the effectiveness for preventing future pandemics.

- Generally, it would improve preparedness and response, especially through international cooperation and support for poorer countries.

"We would, at least, achieve a better preparedness and better capacity for response, involving everyone and all the countries and having the rich countries help the poorer countries to become more prepared." [INT01: Health | Ghazi Kayali]

"There is the mention of early detection and financial and technical resources for the development of vaccines. That means it 's probably possible to act much earlier on a global scale, which can be an advantage for people outside of the Western world. This would be an advantage in my view." [INT08: Social Sciences | Mieke Roscher]

- Some stress that Scenario 2 would improve early detection and limit outbreaks to smaller regions.

"The likelihood that an outbreak becomes a pandemic will be reduced. So, we are probably not reducing the probability of diseases to emerge, but we might be reducing the probability of a localized outbreak or epidemic to become a pandemic before we realize such a risk. But remember, an epidemic can become a pandemic very fast; COVID became a pandemic over the course of a few weeks without most people even realizing it until it was too late." [INT07: Environment/Climate | Moreno di Marco]

"If it's successful at stopping some diseases from spreading, then the implications will be good for human well-being. I guess, it might improve human well-being, but it's pretty minimal. It's just detecting and monitoring." [INT13: Social Sciences | Angie Pepper]

6. Scenario 3: Prevention

a) Effectiveness for Preventing Future Pandemics

Negative aspects for human well-being were only mentioned sporadically and addressed – very broadly – the notion that this scenario wouldn't improve living conditions on a global scale.

"Does this address the workers in the industry? The global health? It will maybe reduce the risk for pandemics to a certain extent, but it doesn't mean that they won't happen at all, and then, it hopefully has positive effects purely on that level. For it to generally change living conditions on a global scale, I wouldn't expect that." [INT11]

6. SCENARIO 3: PREVENTION

The third scenario is called "Prevention" and it places the strongest emphasis on preventing future pandemics:

"The focus is shifting from symptom control to real prevention of pandemics i.e. tackling the root causes of zoonotic disease outbreaks. International institutions call for a paradigm shift in the way humans treat animals and nature. The focus on technical solutions (e.g. in increasing biosecurity) is replaced by the realization that we need to restore the balance between the natural and human worlds. Fur farms are closed. Scenarios for phasing out factory farming are being developed and implemented at full speed and the consumption of animal products is increasingly replaced by plant-based alternatives and cultured meat. Live animal markets are banned/closed. Dog and cat meat trade and commercial wildlife trade are banned. Addressing human health issues is approached holistically and is interlinked with animal welfare and environmental protection. The One Welfare Framework is acknowledged as a guiding principle by international institutions. Animal welfare is a global priority and is integrated in the post 2030 Sustainable Development Goals."

Generally, this scenario is perceived as the most effective, yet also the least likely outcome of an international agreement on pandemics.

"I would be surprised and happy if this was the case." [INT24: Law | Ann Linder]

"To control pandemics, you need to control the symptoms, so you need to have a response. But once a pandemic is under control, then you need to develop a preventative approach." [INT29: Animal Welfare | Rebeca García Pinillos]

a) EFFECTIVENESS FOR PREVENTING FUTURE PANDEMICS

Unsurprisingly given that this scenario already includes "prevention" in its name, it is rated as being the most effective for preventing future pandemics. However, in their reasoning, the experts don't focus on the title but rather the contents of the scenario.

6. Scenario 3: Prevention

a) Effectiveness for Preventing Future Pandemics

(i) REASONS FOR BEING EFFECTIVE IN PREVENTING FUTURE PANDEMICS

This scenario is seen as most effective mainly for two reasons: less contact between humans and animals and – aside from specific measures – a generally holistic approach.

Nearly half of the respondents stress that this scenario is effective because it leads to less contact between humans and animals and less reliance on animal products.

“Wherever there is a close contact between humans and animals – no matter whether they are wild animals or pets or livestock farming – there is the risk of animal diseases becoming zoonotic. And the more we separate our respective living sphere, the lower the risk is. This is the connection.” [INT27: Health | Imke Lührs]

Four areas are addressed specifically:

- Phasing out animal husbandry by getting out of factory farming and – by doing so – using plants more efficiently.

“Animals are kept in huge facilities forced to live on top of their murdered friends and family whose bodies are not removed but left there to rot and decay. This proximity is the number one factor that creates a pandemic.” [INT16: Social Sciences | Natalie Khazaal]

“Especially worth considering is the point of handling non-animal derived food products more efficiently by consuming them directly instead of first feeding them to (farm) animals, (because it) would reduce the demand for land.” [INT10: Nutrition&Food | Kurt Schmidinger]

- Reducing the consumption of animal products.

“We are also moving to a more plant-based alternative to meat, rather than eating wild products. This is really decreasing the risk.” [INT21]

“I certainly can get on board with the idea about the switch towards plant-based and cultivated meat, the rapid shift away from factory farming and indeed perhaps all animal agriculture.” [INT25: Social Sciences | Josh Milburn]

- Banning wildlife trade/fur farming.

“Wildlife trading, wet markets, etc. – those are the sources of emergence of different pathogens (...) These are all associated with the origin of the pandemic.” [INT18: Animal Health | Nitish Debnath]

- Addressing land use leads to less interaction with wild animals

“Around 45 percent of the land surface on the earth is used for grazing livestock or growing crops to feed livestock. That is driving deforestation. It’s destroying native habitat and places like the Amazon; those animals are being displaced and forced to interact, in new and unnatural ways,

6. Scenario 3: Prevention

a) Effectiveness for Preventing Future Pandemics

with both humans and other types of animals that they would never come into contact with naturally.” [INT24: Law | Ann Linder]

Some experts stress that this scenario has a very holistic approach and addresses the root causes of a pandemic:

“We are really tackling the root causes. It is not philosophical; it is not generated by some crazy people; it is actually based on evidence. All our zoonotic disease problems are related to these issues. If we start tackling the root causes, then we will definitely reduce the burden of zoonotic diseases, especially novel emerging of zoonotic diseases.” [INT01: Health | Ghazi Kayali]

“That scenario suggests that things could change, for the non-human world and the human world, and it strikes me as a much stronger kind of recipe if we use that term for how to really prevent a pandemic. That system needs to change in significant ways; tinkering around the edges is not going to get us where we need to go.” [INT20: Environment/Climate | Mia MacDonald]

“To put the One Welfare framework [into action], we should consider that we should move what is now an anthropocentric vision to a more eco-centric vision.” [INT05: Environment/Climate | Serge Morand]

“This is obviously light-years ahead of the first two (scenarios) in terms of addressing those root causes and underlying drivers. Realizing how interconnected all of these systems are and taking that holistic view is really important.” [INT24: Law | Ann Linder]

Sporadically it is specifically stressed that the risk of a pandemic is entirely created by human behavior, although – figuratively speaking – more experts refer to human behavior because the other aspects mentioned above are ultimately based on human behavior.

“All those things that we do - whether it's factory farming, wildlife trade, the dog meat trade and cat meat trade, destruction of habitats for monetary gains or for other industry; whatever it might be, whether it's the mining industry oil palm oil or whatever - all of these things are human behavior, including creating and driving climate change right now. All of those things constitute factors that create the risk of zoonotic diseases or these potential pandemic events and spillover events that are happening.” [INT02: Animal Health | Jim Desmond]

(ii) REASONS FOR NOT BEING EFFECTIVE IN PREVENTING FUTURE PANDEMICS

Some experts perceive this scenario – or parts of it – as not effective in preventing future pandemics.

Most of them state that this scenario isn't sufficient, although the elements identified as lacking varied from expert to expert:

- Solely focusing on prevention is not sufficient and aspects from the other two scenarios of “symptom control” and “preparedness and response” are needed.

“The drawback here is that there is not an element of preparedness and response. I think we still need that element. Prevention is key, but it is not the only thing. We need everything. We need the

6. Scenario 3: Prevention

a) Effectiveness for Preventing Future Pandemics

prevention, the criteria, the necessary response and the recovery.” [INT07: Environment/Climate | Moreno di Marco]

- A treaty by itself wouldn't change much.

“Even if many countries would sign it, I doubt it would change much in reality. As long as the success criteria for business entities is not changed, as long as the tax system is not changed and so on.” [INT14: Environment/Climate | Helga Kromp-Kolb]

- Environmental protection should play a stronger role.

“The one thing I see lacking in this, perhaps because of coming from the animal view, is it doesn't really talk about preventing further destruction of diversity, having stronger protections for existing forest, reforestation, reestablishing more boundaries between human communities and wild, centers of wildlife and habitat.” [INT20: Environment/Climate | Mia MacDonald]

- In terms of managing expectations, it's more about mitigating risks than preventing the next pandemic.

“I think we need to be honest about what these things mean. We can't prevent the next pandemic. We can mitigate the risk, it's risk mitigation; prevention is empirically the wrong word.” [INT23: Law | Jan Dutkiewicz]

Some respondents stress that certain aspects linked to animal welfare – e.g. animal agriculture and fur farms – are not responsible for the pandemic.

“We see that the traveling of humans seems to be a major cause of the spread of the outbreak of the pandemics. This is why, I think, animal welfare has a role to play in this type of topic, but I don't necessarily think it's at the top of the list. And I think there are other factors that are probably playing a larger role in this topic.” [INT07: Environment/Climate | Moreno di Marco]

- Animal welfare isn't directly linked to the size of the keeping system.

“Small doesn't mean good and big doesn't automatically mean bad. I also don't use the term mass animal farming conditions (factory farming) - you will not have heard that term from me so far. There are good conditions of farming and bad ones, and there are also a lot of bad small farms.” [INT11]

- Fur farms and cat and dog meat trade are not relevant for the emergence of pandemics.

“But, closing down fur farms and banning dog and cat meat trade and live animal markets - that's not the reason why we have the pandemic. It's almost like we are pointing our fingers at different activities (than those) where the pandemic actually came from. But that is not the root cause.” [INT26: Social Sciences | Susan Chiblow]

Experts sporadically stress that aside from having an agreement, the local implementation will be a major challenge.

6. Scenario 3: Prevention

b) Likelihood of being part of an international Agreement

"I should probably make a distinction between the goals that may be set and the reality of what will happen in implementing those goals on the ground. Even if we strive for some things in scenario three, I would be surprised to see them implemented as fully as they're described here." [INT24: Law | Ann Linder]

b) LIKELIHOOD OF BEING PART OF AN INTERNATIONAL AGREEMENT

As unanimously as this scenario is seen as being the most effective, it is also seen as the least likely because it requires the greatest change. Categorizing it as the least likely scenario is primarily explained with two arguments: economic interests combined with missing political will and cultural/behavioral aspects that prefer the status quo.

"This is, I think, the least likely of all three, at least based on the policy conversation that is going on in the moment." [INT07: Environment/Climate | Moreno di Marco]

(i) NOT LIKELY/INHIBITING THE PROCESS

When explaining why this scenario is not likely, the respondents focus on several inhibiting factors, mostly economic interests, a lack of political will and cultural aspects.

"There are plenty of things that are going to inhibit this scenario. One is political will. The other one is cultural will, because you would be asking everyone to change their behavior, from policy makers to industries, to businesses, all the way down to individuals." [INT01: Health | Ghazi Kayali]

"In conversation, when I bring up the root cause of many problems that we have - climate change and all the pollution that we have to the environment - it seems like no one wants to deal with that root." [INT28: Animal Health | Natalia Cediel]

Economic interests are frequently seen as the inhibiting factor for this scenario. However, there are several facets to economic interests:

- Interests of big businesses commonly referred to as factory farming.

"There is absolutely zero political interest in opposing animal exploiting or animal commodifying industries. I think these industries are politically powerful in a number of countries. I think these industries are seen as economically important in a number of countries. I think these industries are seen as paradoxically contributing to health via nutrition in a lot of countries. I'm talking about animal farms. So, I see no chance of this scenario as a whole." [INT23: Law | Jan Dutkiewicz]

- Economic interests – the workers' perspective.

"I think that lots of people would find it bad. First of all, there would be the people who work in those industries, and those are large industries." [INT13: Social Sciences | Angie Pepper]

6. Scenario 3: Prevention

b) Likelihood of being part of an international Agreement

- One respondent stresses that a change of the financial and business system is necessary.

"I don't believe it will work out if you don't change the financial and business system first. If I keep measuring the success of economic systems on the financial situation, then those measurements won't work out. You have to go much deeper. Sure, the financial situation is one point of success, because companies have to be able to survive. But besides economic success, you have to measure the ecological and social success as well, and evaluate companies on all three dimensions at the same time." [INT14: Environment/Climate | Helga Kromp-Kolb]

Closely linked to economic interests is the lack of political will, which is mentioned sporadically.

"It's unlikely that animal agriculture is going to create quickly a different type of facility that doesn't rely on proximity and where there is enough space to prevent pandemics. I just don't see this happening anytime soon, given how unlikely, how difficult it's been to force the industry to increase the space each animal has by a few inches." [INT16: Social Sciences | Natalie Khazaal]

Also frequently mentioned are cultural/behavioral aspects that usually prefer the status quo.

"I think that it is less likely because it demands changes that people are not prepared to make with regard to their daily lives." [INT13: Social Sciences | Angie Pepper]

"That is our lifestyle; the root is that we are consuming many things that we will need and are hurting and are harming other beings." [INT28: Animal Health | Natalia Cediel]

- Regular people are not yet making the connection.

"For many people, these connections haven't been cemented and established in a way that would justify, for them, changing their own behavior." [INT24: Law | Ann Linder]

- Cultural attachment to specific practices.

"Here are archaic issues - people have less of a problem with having to switch from a landline to a mobile phone on a global, collective scale within a few years, but with nutrition, tradition plays a role too. When you tell people they have to eat less meat, you can see the reactions: it's an impulsive reaction, and politicians like to utilize that, especially populists." [INT10: Nutrition&Food | Kurt Schmidinger]

- One respondent mentions that most people have other priorities.

"I think it's least likely, because the people who would accept scenario three are those who are mostly, as I said, on the right of the curve. Basically they are people who really see life, the meaning of life through a moral perspective, through fairness. Many others don't share this perspective. They see only their economic advantage and they're driven by survival and reproductive goals rather than, you know, building a more moral, a more just world." [INT16: Social Sciences | Natalie Khazaal]

- Again, the symbol of individual choice is mentioned once.

6. Scenario 3: Prevention

b) Likelihood of being part of an international Agreement

"When it comes to that topic, for many people it's still a symbol of freedom – like driving a car, traveling wherever you want to go and eating what you want, however unhealthy. That's the freedom that people think they totally need, even though it has such extreme consequences for other beings and for the planet and for their own health." [INT10: Nutrition&Food | Kurt Schmidinger]

- One respondent highlights that meat consumption is still increasing.

"The extreme wording (in the formulated prevention scenario), e.g. 'abandonment of animal products'... no, they are saying: animal products are increasingly replaced... But I don't see that. There is a tendency towards the opposite direction. Meat consumption is still increasing." [INT12: Environment/Climate | Hanns Moshhammer]

Some respondents mention that the scenario itself or certain aspects of it are not practical and therefore unlikely to happen, e.g. the focus on replacing animal meat or closing live animal markets.

"I think when you're talking about replacing animal meat, for example, with plant-based – that's not practical at all. When you have strategies that are like that, I think, it becomes rather a turnoff to actually implement." [INT06: Health | Syra Madad]

"And there are two problems with this [scenario]. The first one is that the element of prevention is there, but an element of realism is completely missing. A scenario that for example says, "Live animal markets are banned or closed" is completely unrealistic to me. And this might be counterproductive, because what might happen is that live animal markets are not closed, they just become illegal, hence impossible to control and manage." [INT07: Environment/Climate | Moreno di Marco]

A few experts stress that this scenario might be viable for developed countries but problematic for developing countries, linking to the concept of Eurocentrism.

"When you're looking at Germany or Northern European countries, it's not that far from reality; transformation of animal husbandry is being discussed." [INT03: Nutrition&Food | Gesa Busch]

"But that [scenario] is for people in developed countries. For people in developing countries, I am a bit concerned that this scenario will have negative consequence unless it comes with very strong international incentives and aid systems. Bear in mind that there are countries in the world in which wildlife consumption and localized farming do play a big, big role in terms of protein production." [INT07: Environment/Climate | Moreno di Marco]

Two respondents don't perceive this scenario as being likely because the measures are not related to pandemics.

"I think that is very unlikely, because it is not a pandemic-oriented scenario. It includes all the ideas of the animal rights movement, e.g. from FOUR PAWS; it puts everything in there that's desired, where, in part, no direct connection can be made. What does the trade with dog and cat meat have to do with the pandemic – I don't know of any connection here and so on." [INT11]

6. Scenario 3: Prevention

c) Ways for promoting/advancing this scenario

(ii) LIKELY

Even though this scenario is primarily seen as unlikely, some respondents also see opportunities for its realization, either in parts or in the long run.

A few respondents perceive the pandemic as an enabler that makes this scenario more realistic.

“There is, in my view, an unprecedented opportunity, at the present moment, for a conversation on ending industrial animal agriculture. So, five years ago, it would have almost been impossible to even imagine raising a prospect of dismantling industrial animal agriculture as something realistic, as a political proposal. But, I think, if you combine COVID-19 with what is going on in terms of anthropogenic climate change and the recommendations from the IPCC to reduce meat consumption as the solution, I think that there is actually a serious opportunity for animal advocates to make the case for this, for scenario three (prevention). Realistically it’s going to take a while. But it’s the best time it has ever been, I think, to make this proposal.” [INT09: Social Sciences | Dinesh Wadiwel]

Respondents sporadically stress that specific aspects of this scenario – e.g. moratoriums on fur farms and live animal markets – might come true.

“The prohibition of live animal markets is totally realistic. The restriction of the dog and cat meat trade is also quite realistic.” [INT08: Social Sciences | Mieke Roscher]

“I see a possibility of the fur farm moratorium because fur farms are not popular and they’re not that economically important. I see a possibility for live animal markets to be closed or phased out, just as I see a possibility for stronger enforcement of the wildlife trade.” [INT23: Law | Jan Dutkiewicz]

This scenario is also sporadically perceived to be feasible in the long run.

“I think eventually in the long run, we can do it. We can define our goal, but also have steps that we want to achieve one after the other. If we do that, it is going to take a lot of work, it is going to take a lot of time. But eventually, we can get there.” [INT01: Health | Ghazi Kayali]

One expert mentions that the UN has been a forerunner in certain areas.

“The UN organizations make some progress every once in a while. They do resolve things, which are very future-oriented and ground-breaking, because they focus on the whole world and because they can be sure that it is not them who need to implement all the measures. Accordingly, I could well imagine that this summit leads to a pandemic agreement, which is in line with scenario 3.” [INT27: Health | Imke Lührs]

c) WAYS FOR PROMOTING/ADVANCING THIS SCENARIO

While discussing the likelihood of this scenario becoming part of an international agreement on pandemics, the experts also voiced several suggestions for promoting/advancing this scenario:

6. Scenario 3: Prevention

c) Ways for promoting/advancing this scenario

- Some suggest a stronger push for plant-based products and cellular agriculture, e.g. by the government investing in research and development for plant-based alternatives or providing financial incentives to consumers (lower taxes) on plant-based products. Additionally, it is mentioned that ultimately consumers can support that change by opting for plant-based products.

"Some of the market-driven things, like the cultured meat and a lot of the developments and alternative, plant-based protein foods, I think, those are the kind of things that, over time, could have a big impact, as long as they are affordable. Because a lot of people don't realize where their meat comes from." [INT02: Animal Health | Jim Desmond]

"I think that phasing out factory farming will only become a reality when consumers shift their behavior as they gain access to enough, better and cheaper non-animal alternatives. Consumers are going to shift their attention and their taste to these other alternatives. And then factory farming will start suffering economically and losing money. This is when we'll start seeing factory farming phasing out itself and switching to other businesses." [INT16: Social Sciences | Natalie Khazaal]

"I think governments could and should absolutely, for example, invest in R&D or provide tax credits for the establishment of alternative protein and cellular agriculture, research and production facilities. I think that's a no-brainer. I think that has a lot of promise for economic growth and has a lot of promise for alternative means of producing protein that don't have remotely the same contribution to zoonotic disease risk (as livestock). If those plant-based alternatives and/or cultured meat become affordable and become more widespread, people, if given the option to not have an animal killed but you can still have your cake and eat it too or have your steak and eat it too or whatever, then, I think, that would be a game changer for people." [INT23: Law | Jan Dutkiewicz]

- A few respondents stress that this scenario could be advanced as a result of climate impacts and adaptation.

"I think some of these things are going to be decided for us, as climate change continues to accelerate, and we're less and less able to grow crops in the areas that we previously had, to feed our livestock, as the sea levels continue to rise, we're going to be confronted with these realities day after day. And so, I think, someday, this [scenario] will be feasible." [INT24: Law | Ann Linder]

- Moreover, a few respondents emphasize education and promoting social change.

"We need a social change. Banning something is not going to be as effective as creating and proposing the cultural and social alternative for a change – if we can add, for example, campaigns in countries where the use of the wildlife product is still very popular and still very high, if we can somehow engage societal influencers, such as actors, football players, somebody who can speak to the masses and promote an alternate way of life." [INT07: Environment/Climate | Moreno di Marco]

"I think, when people talk about alternative food systems, they have this image of someone – possibly me, possibly a police officer – coming into their house and rooting through their fridge and saying, "Oh, you're not allowed this; you're not allowed this." And of course, that's not what we're talking about when we're talking about food system change and food policy. We're talking about which kinds of farming are permissible, which kinds of farming will be supported, which

6. Scenario 3: Prevention

c) Ways for promoting/advancing this scenario

kinds of farming will be phased out, which kinds of farming will be phased in – these kinds of questions. That will of course impact what kinds of things people can buy in supermarkets. But it's not a case of people literally coming into people's houses, taking foods out of fridge or checking what's on plates." [INT25: Social Sciences | Josh Milburn]

- Respondents sporadically suggest advancing this scenario by stressing its cost-effectiveness, i.e. the notion that the costs of prevention are lower than the costs of dealing with a pandemic.

"There is a strong focus on prevention. As I mentioned before, prevention is the most cost-effective way to deal with disease emergence risk. The more we can prevent, the less we have to control. And preventing is going to be always cheaper than controlling." [INT07: Environment/Climate | Moreno di Marco]

"I know an article from "Science". They have calculated that the preventive measures that need to be taken to prevent future pandemics – and this would be in line with scenario 3 – until 2030 would only amount to 2% of the costs of what the Corona pandemic cost us so far. And if you just focus on this cost aspect, regardless of all ethical aspects, it becomes clear that it has to be scenario 3." [INT27: Health | Imke Lührs]

- The environmental movement and its long-term perspective is also sporadically suggested as a role model.

"We have the model of climate change politics as an example of how radical change is possible, though it takes time. Over the last 15 to 20 years, there's been a movement globally against fossil fuels. And it has now reached an extraordinary level, where seemingly most countries have an active movement against coal economies, divesting from coal powered energy, divesting from digging up coal, and encouraging other nations to do the same. And there is an active conversation in the public sphere about how we transition our economies away from fossil fuels. It didn't come about by making small scale demands. Actually, environmentalists have made quite radical demands and recognized from the start that we needed to just stop this form of energy production." [INT09: Social Sciences | Dinesh Wadiwel]

Additionally, some more suggestions were raised, although each suggestion was only voiced by a single respondent.

- Developed countries should take a pioneering role.

"I think that countries like Germany or other European countries can play a pioneering role, countries who can afford it and where the public is ready to go that path. In Germany, we are at a point where many people say that they don't want that type of animal farming anymore, which shows in political changes too. If I manage to change animal husbandry here, that is a first step; but that is a process that takes decades. If we look at other countries, they are just building the very same intensive farming structures that we are aiming to phase out – in Russia and China, (for instance, and the facilities are) also in much bigger dimensions, which we cannot even imagine. It would be a first step in countries where we can do this, to go ahead and actually go through with it." [INT03: Nutrition&Food | Gesa Busch]

- The costs of production for animal agriculture should be increased through more stringent animal welfare laws.



6. Scenario 3: Prevention d) Implications for animal welfare

“When we are talking about factory farming, intensive animal agriculture is only possible, at least in the most developed industrialized democracies, because of exemptions to animal welfare laws. If you did to a dog or a cat what you do (to animals) on the average factory farm in the US or Denmark or Spain, you would go to jail. These operations only exist because of exemption to animal welfare laws or the absence of animal welfare laws. So, if you were to literally apply the same standard of animal treatment requirements as are applied to domestic pets to animals used in meat production, that would make intensive animal meat production impossible overnight, it would make it legally impossible.” [INT23: Law | Jan Dutkiewicz]

- Cultural differences should be taken into consideration.

“In global health policy, we come up with a policy that applies to the world. But the policy affects parts of the world unfairly or unevenly. Some countries, perhaps, have a better capacity to abide by the treaty. Some countries in the world will be less impacted. And then, there are some parts of the world that will be much more impacted by the transformations that scenario 3 is demanding. So, we need to be very careful.” [INT19: Health | Renzo Guinto]

d) IMPLICATIONS FOR ANIMAL WELFARE

The vast majority of respondents who addressed this issue mention positive implications for animal welfare. Only two respondents mention negative aspects and four respondents perceive no change for animal welfare.

POSITIVE ASPECTS

The positive aspects mainly address the reducing industrial animal agriculture, and banning wildlife trade and other activities.

The reduction of industrial animal agriculture/factory farming is frequently mentioned as a positive aspect.

“It would be incredible for animal welfare if wildlife trade was banned and there’s no factory farming. Most people don’t realize the massive amount of animal suffering that happens through the way we raise animals.” [INT02: Animal Health | Jim Desmond]

“Curtailing industrial animal agriculture is the number one way to reduce the number of animals that are used in conditions that are highly unsatisfactory for those animals.” [INT09: Social Sciences | Dinesh Wadiwel]

“It would provide a pathway for animal agriculture to wind down. Certainly, in large-scale animal agriculture, billions of animals would be spared coming into the world to be mutilated and tortured, live nasty short lives and then be slaughtered. That’s obviously a huge benefit.” [INT20: Environment/Climate | Mia MacDonald]

Some respondents stress the banning of wildlife trade, fur farming, and trade of dog and cat meat.

6. Scenario 3: Prevention d) Implications for animal welfare

"We would have the prohibition of live animal markets and no dog and cat meat trade, even though that is a marginal area, but also no wild animal trade, which would also imply the closure of zoos, something that is quite effective by the way." [INT08: Social Sciences | Mieke Roscher]

Ethical aspects and the way in which we generally deal with animals are sporadically mentioned.

"I think it could have a real clarifying (effect), overturning the way we have been dealing with animals for at least the last several hundred years. There could be many ripples of impact." [INT20: Environment/Climate | Mia MacDonald]

Some respondents refer to generally positive developments, without being too specific.

"It is the only scenario that would change things significantly. It says that animal welfare should take priority, so it would mean setting priorities. Things would change massively." [INT08: Social Sciences | Mieke Roscher]

"And an automatic side effect would be more animal welfare. Again, this is from an anthropocentric point of view." [INT27: Health | Imke Lührs]

Other positive aspects each mentioned by only one person include implementing an animal welfare label and claiming that animal welfare being should be included in the Sustainable Development Goals (SDGs).

NEGATIVE ASPECTS/NO CHANGE

Hardly anybody sees negative implications of this scenario for animal welfare.

Respondents are sporadically concerned that by banning certain activities, those activities will simply move to areas in which they can't be controlled.

"Ban of the trade of some species – that has been very effective for some species but has caused some other markets to go completely illegal, and at that point, you cannot control the market anymore. At that point, animal welfare is going to be even worse than before." [INT07: Environment/Climate | Moreno di Marco]

It is also sporadically stressed that it remains unclear what will be implemented.

"It is not defined what needs to be implemented. Yes, there is a connection established in the balance between the animal world and the human world, and well-being is a priority consideration, whatever that means. What are the fundamental principles that need to be introduced?" [INT11]

6. Scenario 3: Prevention

e) Implications for human well-being

e) IMPLICATIONS FOR HUMAN WELL-BEING

The experts were also asked about their expectations for human well-being if this scenario was part of an international agreement on pandemics. The experts voiced – nearly exclusively – positive implications for human well-being.

POSITIVE ASPECTS

The positive aspects covered several areas but mainly focused on health implications based on eating less meat, safeguarding the environment, and fighting climate change.

“There would be synergies. We would have antibiotics efficacy protected for the next generations; we would also have a positive impact on climate change, on the protection of our water, biodiversity, loss of fertile ground through erosion. All of these points, we would improve them with these measures – it would be wonderful.” [INT10: Nutrition&Food | Kurt Schmidinger]

- The respondents frequently stress that Scenario 3 would lead to eating less meat and a healthier diet, which would have positive implications for human well-being.

“The protein requirements of the society decrease because the recommendations of the German Society for Nutrition states that we have an average meat consumption of 60 kg per capita annually – that is a statistic figure which includes vegetarians and vegans – and the German Society for Health and Nutrition recommends half of that for health reasons – maximum 30 kg.” [INT04: Animal Health | Michael Marahrens]

“We know that a high consumption of animal products leads to heart disease, certain types of cancer, auto-immune diseases, type II diabetes, all correlating with too many saturated fats from animal products, etc. – all of that would also be solved.” [INT10: Nutrition&Food | Kurt Schmidinger]

“I’m not a nutritionist; I know that these things are highly debated, but broadly speaking, removing or reducing animal source food and especially highly processed animal source food in our diet would be a huge improvement, and of course highly processed animal source foods are only possible in an industrial intensive food production model.” [INT23: Law | Jan Dutkiewicz]

- Moreover, environmental aspects are frequently mentioned as a positive side-effect of Scenario 3 for human well-being, e.g. less space needed for livestock, fewer problems with manure and positive aspects for biodiversity.

“Concerning size, the limitations are much more of an ecological nature, because: Where does the manure go from the big farms? Is it really spread equally onto the fields? Is it worthwhile to transport it that far, etc.?” [INT11]

“We need to improve animal welfare in order to protect and promote human well-being. There is also an understanding of not having huge livestock operations, which are not just damaging to animals but also to the environment in terms of the grain and the space needed and all the damage that that does.” [INT13: Social Sciences | Angie Pepper]

6. Scenario 3: Prevention

e) Implications for human well-being

"I think it's very good. For me it's the best scenario, because we have to restore our connection with biodiversity and nature." [INT05: Environment/Climate | Serge Morand]

"Human well-being would be improved. Certainly, animal agriculture is contributing to climate change; it's a leading factor in deforestation and biodiversity loss. Scientists have told us, we need biodiversity to protect human life on this planet as well." [INT20: Environment/Climate | Mia MacDonald]

- Some also stress that Scenario 3 will help in fighting climate change and by doing so will have positive implications for human well-being.

"(Measures listed in scenario 3 are) the one thing you can do that would have the most impact in terms of improving not only animal welfare, but also affecting climate change. There are so many things that go into producing a pound of meat that have a negative impact on both the environment and animal health, and animal welfare. I would be thrilled if that (scenario 3) happened." [INT02: Animal Health | Jim Desmond]

"Transitioning away from factory farming, or at least the development of that transition, that's the crux really, not only in the prevention of pandemics but also to stop global climate change – which is one of the things that should happen straight away." [INT08: Social Sciences | Mieke Roscher]

"If you only consider the aspect of consumption of animal products alone, which is interlinked with the climate aspect, we will not be able to continue the way we are going now. You can't do anything but demand that this is implemented: phasing out factory farming and reduction of consumption of animal products, replaced by plant-based alternatives." [INT27: Health | Imke Lührs]

- In addition to these main areas, some experts stress that this scenario would be generally positive for human well-being.

"As hard as it is to do that, I feel like this scenario brings many more (benefits) – you can almost see the planet changing in a much more positive direction. Whereas the other two scenarios are better than nothing, but they still suggest that things would continue similar to how they are." [INT20: Environment/Climate | Mia MacDonald]

- It is also sporadically mentioned that Scenario 3 would also help regarding antibiotic resistance.

"There is also a whole host of secondary issues that we could talk about: whether that is antibiotic resistance and similar things, or that the livestock trade is not only creating disease opportunities but also making us less able to treat those same sorts of outbreaks, by driving things like antimicrobial resistance." [INT24: Law | Ann Linder]

NEGATIVE ASPECTS

Negative aspects of this scenario for human well-being are hardly mentioned, and sporadically the experts refer to economic effects/unemployment.



6. Scenario 3: Prevention

e) Implications for human well-being

"In the short term, it would destroy our economies or the livelihood of many small business, indigenous communities and people who are dependent on such sectors. There are already many poor people who are dependent upon wildlife meat or work in the meat industry or livestock sector. Their lives will be really disrupted." [INT21]

"We also need to talk about the economic impact. And I'm thinking not just about global or national economy, but individuals. So what effects is this going to have on rural economies? What effect is this going to have on the livelihoods of the people who currently work on farms, for example? Because otherwise we're going to devastate local and rural economies, and we are going to leave a lot of people, who aren't bad people, out of work." [INT25: Social Sciences | Josh Milburn]

Additionally, one expert stresses that it needs to be taken into account how people should be fed if animal agriculture will be banned.

"Now, with regard to human well-being, there's going to be very positive health impacts but there are serious questions that we need to ask about number one, ensuring alternative food supply. We can't click our fingers and just ban animal agriculture because how would we feed people." [INT25: Social Sciences | Josh Milburn]



7. One Welfare a) Awareness

7. ONE WELFARE

'One Welfare' is a concept mainly proposed by Rebecca Garcia Pinillos et al. in the context of discussions about adequate global health approaches (Pinillos, et al., 2016). One Welfare builds on the One Health concept and is a way to recognize the many social interconnections between human welfare, animal welfare and the integrity of the environment. In practice, it is also a call for a coordinated program of action to a) improve animal welfare to improve human welfare (and vice versa), b) coordinate actions between animal protection and other services, and c) protect the environment as a fundamental step for both human and animal welfare. One Welfare also seeks to promote key global objectives such as supporting food security, sustainability, reducing human suffering and improving productivity within the farming sector through a better understanding of the value of high welfare standards (One Welfare, n.d.).

This chapter portrays respondents' awareness and initial impression of One Welfare and discusses how they view the framework as it relates to One Health. Finally, respondents' suggestions on how to advance the framework are discussed.

a) AWARENESS

Similar to the presentation of the One Health concept, the respondents received a brief paragraph outlining One Welfare in advance of the interview and were also read the following paragraph:

The third scenario embodies the "One Welfare" framework. The emerging One Welfare Framework complements the One Health concept and is a multidisciplinary holistic approach that analyzes and leverages the synergies between human well-being, animal welfare and the environment to produce more resilient systems with fewer vulnerabilities. While One Health focuses specifically on health impacts, One Welfare recognizes that linkages between human well-being, animal welfare and the environment affect more than just health, and indeed impact issues as diverse as food security, livelihoods, climate change, and biodiversity.

In contrast to the One Health concept – which is well known among the interviewees – the One Welfare Framework is only known by approximately half of the respondents.

b) INITIAL IMPRESSION

The initial impression of One Welfare is primarily positive. However, due to approximately half of the respondents being unfamiliar with the framework, the responses are often slightly vague. Nevertheless, it can be said that respondents frequently appreciate the concept's multidisciplinary outlook. Criticisms of some

7. One Welfare

b) Initial impression

respondents is the fear that animals could still be harmed under the framework and that the concept may be anthropocentric in nature and does not go sufficiently far in relation to ending animal exploitation. Furthermore, for some respondents, the advantages to One Health remained unclear.

(i) POSITIVE: MULTIDISCIPLINARY APPROACH AND GLOBAL OUTLOOK

Respondents frequently feel that the concept is very multidisciplinary and holistic in the sense that different fields of science as well as field-specific concepts like biodiversity and climate change can be included well.

"I really like the inclusion of concerns of food security, livelihoods, climate change and biodiversity, because this is the kind of holistic concern that I think we need. And we need to have (this holistic concern) when we're thinking about food systems, especially in lots of other policy areas. And I think these are things that are easy to miss. [...] It's so easy for food and animal advocates to miss an environmental advocate." [INT25: Social Sciences | Josh Milburn]

"A conceptual framework which unites and depicts the symbiotic system between humans, animals and nature. It is an ethical concept, and it is extremely exciting for scientists. I, as scientist, would like to be able to contribute and show that the positive relations between environment, human and animal welfare do exist. I would like to characterize how resilient they are and to what extent they can make us more resilient." [INT15]

"If we speak about climate change nowadays, we cannot avoid thinking about livelihoods, food security and biodiversity. [...] Whether we want it or not, these things come together. And if we are not able to make them come together, we'll make actions ineffective. Because if we want to tackle climate change and impact livelihoods, they can only be addressed together. Similar for biodiversity and food security." [INT17: Economics | Martina Bozzola]

A single respondent thinks that the global level of policy focus means that there is possibility for the concept to be attached to UN resolutions.

"The most convincing argument is that it can be attached to UN resolutions - bodies like WHO, among others. For a multidisciplinary approach to work globally, a lot of stakeholders should be on board, and that is always difficult. It's always a problem to decide responsibilities and allocations." [INT08: Social Sciences | Mieke Roscher]

(ii) POINTS OF CRITICISM

ANIMALS COULD STILL BE HARMED UNDER THE TERM "WELFARE"

Some respondents feel that the welfare concept is characterized by an unwillingness to challenge existing industries that produce animal products, such as the agriculture industry. It is also mentioned that welfare – as understood by the respondents – means that animals cannot live out species-specific behavior.

7. One Welfare

b) Initial impression

"A welfare approach is often going to be unwilling to challenge existing human-animal relationships, even when they should be challenged. Because it just wants to make something more animal friendly or even and this was in your definition: resilience, resilient systems. Actually, when we're talking about animal agriculture, I don't think we should want any more resilience. We want it the opposite - we want it broken down. So, one of the classic worries from an animal rights perspective about an animal welfare approach is that it just plays into the hands of animal agriculturalists." [INT25: Social Sciences | Josh Milburn]

"I believe the term "welfare" may be something that could be improved because animal welfare does not necessarily ensure the end of exploiting other animals. On the contrary, it may be dependent on exploitation by ensuring that other animals exhibit certain biomarkers of health and happiness, yet they wouldn't really be free-living beings who're in control of their own lives. With regards to humans not being able to continue exploiting other animal species, I think that would improve somewhat. [...] The decades-long debate between welfarism and animal rights, or between keeping animals healthy while exploiting them versus restoring their rights to decide their own life will resolve when we see the mass scale production of viable non-animal alternatives, kudos to rights activists' long, long efforts." [INT16: Social Sciences | Natalie Khazaal]

"My main concerns are certainly about welfare itself. And as I mentioned, the politics of welfare are that it doesn't necessarily challenge our right to use animals as commodities or as food. It just simply says we should be reducing unnecessary suffering or reducing violence towards animals where possible. It does not challenge our right to use animals in the first place. Now, I think it's more complex than that in practice but I think that's one of the problems with the welfare framework." [INT09: Social Sciences | Dinesh Wadiwel]

CRITICISM OF ANTHROPOCENTRICISM

A few respondents describe the concept as being anthropocentric because humans are granted "well-being", while "welfare" pertains to animals. This is said to portray an asymmetry between the species, thus propagating human exceptionalism and creating distance and hierarchy between species. Respondents feel that there was a need to change this by using the term "well-being" for humans and non-human animals alike.

"Why not One Well-being? Let's parse the sentence "recognize the linkages between human well-being and animal welfare." Notice how for humans it's well-being, but for other animals it's welfare. Why is there a different term? It comes from a speciesist framework which creates and promotes human exceptionalism. Why not linkages between human and non-human animal well-being without using welfare? Because it's a term that sees humans elevated." [INT16: Social Sciences | Natalie Khazaal]

"Once you have this notion of well-being on the table, it's not just about whether an animal is in pain or not, which is where the welfarist position is perhaps narrower. But rather ask "What kind of circumstances does this particular creature need to have in order to live well, to have a flourishing life as the kind of creature that it is? It is a much more expansive notion." [INT13: Social Sciences | Angie Pepper]

"I find most striking this kind of asymmetry between thinking of humans as having well-being and non-human animals as the kinds of things that have welfare. [...] That's the worry with this way of framing: thinking about health and welfare as a holistic approach. When it has this kind of



7. One Welfare

c) One Health and One Welfare

anthropocentric bias, it just means that there are many, many issues that might affect animals and the environment that don't get onto the agenda because they don't matter to us." [INT25: Social Sciences / Josh Milburn]

c) ONE HEALTH AND ONE WELFARE

By definition, "One Welfare **extends** the approach of (and partially overlaps) the One Health theme used for human and animal health" (One Welfare, n.d.). One Health focuses on human, animal and environmental health and the clinical aspects of it. One Welfare includes these health aspects and adds the dimension of well-being and welfare. Thus, it takes into account broader considerations, leading to a holistic approach enabling better cross-sector collaboration, research and solution-finding to ensure sustainable progress for human well-being, animal welfare and environmental well-being (Rebecca, 2018).¹

Interviewees were asked whether they see the need for the One Welfare Framework to complement One Health or whether One Health is already holistic in itself to include those aspects featured by One Welfare. A majority argued for the need for One Welfare to complement One Health, although some respondents felt that One Health was sufficient and that One Welfare would be redundant.

Furthermore, some respondents feel positively that the introduction of a second concept will not infringe on the progressing of either, while some fear that adding a further concept would perhaps become a distraction and could hinder the progression of both concepts.

(i) COMPLEMENTING EACH OTHER

EXPANSION OF ONE HEALTH

Respondents frequently feel that One Welfare better considers the linkages between human well-being, animal welfare and the environment. Therefore, it is understood as a natural progression to the One Health concept, which is deemed narrower.

"In some ways this is a natural extension of One Health and a filling out of that picture. To me, this is something that I personally subscribed to, something that feels quite intuitive to me and, I

¹ "Environmental wellbeing means leading a lifestyle that values the relationship between ourselves, our community, and the environment. Individual wellbeing is affected by the environments we live in and we as individuals also have a significant impact on these environments. Cultivating environmental wellbeing requires us to recognize our responsibility to protect the earth and promote lifestyle practices that serve to sustain the natural environment and its resources" (David S. Rosenthal Center for Wellness and Health Promotion Harvard University Health Services, n.d.)

7. One Welfare

c) One Health and One Welfare

think, something that colors a lot of the findings of our research, too. It just makes good sense that all of these things are connected and that when the system as a whole is functioning better, each piece of it will do the same.” [INT24: Law | Ann Linder]

One Welfare is more encompassing than just One Health. We are back to that phrase, “One world, One love”, and so, I see that One Welfare can include the One Health concept. Because it talks about acknowledging that the health approaches are about interrelationships and interconnectedness to the world and to the well-being of humans, animals and the environment. I think they are directly linked together.” [INT26: Social Sciences | Susan Chiblow]

“It is an extension of the One Health approach really. [...] One Welfare is in its wording more pleasant in my opinion, because it aims for wellbeing. As I said in the beginning, an animal can be healthy, but not necessarily feel well and that is also the case for any human. I like that wording better because it includes more.” [INT03: Nutrition&Food | Gesa Busch]

One of the interviews was conducted with Dr. Rebeca Garcia Pinillos – founder of the non-profit social enterprise One Welfare Community Interest Company – who she sees One Welfare complementing One Health:

“It’s really integrating it with a whole new set of professionals that have been systematically excluded from those collaborative approaches and really need to be part of it [...] and bringing animal welfare and well-being professionals into this global work to tackle complex problems.” [INT29: Animal Welfare | Rebeca García Pinillos]

Again, the conversation of holism arose. Respondents sporadically indicate that the framework is an upgrade in terms of holism compared to One Health. The interconnected outlook of the concept is also regarded as favorable.

“Especially during the pandemic, it became clear how everything is interconnected and that we don’t live on an island. Just looking at human health, we are also all connected. Just as the migration movements have shown that we don’t live on an island and can just be indifferent about what is happening elsewhere. I think many people are aware of these interconnections and that a balance is needed here and that you can’t just look at the humans and only the well-being of one continent, but instead holistic concepts are needed.” [INT03: Nutrition&Food | Gesa Busch]

“It is even more extensive; I like it even better, and it excludes one-sided solutions that want to build castles and confine everything and then (hope) it should somehow work. We also have many other problems; we really have to think in an interdisciplinary way – that is very important. I cannot just deal with epidemic prevention singularly, there are many other problems worldwide. Groundwater contamination with nitrates – I don’t get a grip on this if I continue factory farming and spray manure on the fields, we’re not managing the pandemics anyhow, but the fact is, scenario 3 fulfils exactly this and would be a holistic approach for improved living conditions for all beings on this planet.” [INT10: Nutrition&Food | Kurt Schmidinger]

Sporadically, respondents indicate that One Welfare is superior in terms of protecting animal health because the concept acknowledges the interconnectedness of the environment, animals and humans. Furthermore, it is lauded for acknowledging “welfare” as being applicable to animals. Animals are therefore said to have an intrinsic value under One Welfare, rather than their value

7. One Welfare

c) One Health and One Welfare

coming via their relationship to human health, as is said to be the case under One Health.

“One Welfare goes a step further in acknowledging that animals or the environment can have welfare apart from their health. One Health – you can look at it from purely a self-interested perspective, right? I want to protect my own health and the only way to do that is to protect the health of these other two things, but not necessarily because they have intrinsic value, but purely because that’s what I need to do to look out for me. [...] One Welfare takes a step further in terms of recognizing the intrinsic value that animals or the environment may have. And not just in that they can be healthy or not healthy, but that they can have a good quality of life and be happy and thrive.” [INT24: Law | Ann Linder]

Finally, biodiversity is said to be better represented under the One Welfare Framework.

“The animal welfare element is not sufficiently established into the One Health. I could say the same for the environmental aspect of it. I do not feel there is enough clearance and understanding about the role of biodiversity as part of One Health, despite the environmental health being an element of it. [...] Let us improve One Health.” [INT07: Environment/Climate | Moreno di Marco]

PEOPLE CAN UNDERSTAND MULTIPLE CONCEPTS

Some respondents feel that the general public would understand a second term being introduced alongside One Health and that this change would not interfere with the progress of the two concepts or confuse the general public.

“I would go for the One Welfare approach. It’s a pure terminology for someone who doesn’t know yet what it is. It sounds more inclusive and more realistic. I don’t see this problem because also One Health is mainly used by people who are working in the field. It’s known. But I wouldn’t say the population is already familiar with this term. So, I don’t see the big problem in talking about One Welfare instead of One Health.” [INT17: Economics | Martina Bozzola]

“To me, that’s much less important than the underlying concepts, and whether those take root, I think, is a different question. I think people are capable of this type of understanding. You may say that one is a building block towards the other; I don’t think it has to be One Health or One Welfare and those two things are not in opposition in my mind. It’s just a step ladder towards progress.” [INT24: Law | Ann Linder]

“I don’t think it necessarily makes that big a difference, and I can’t say that using a different term will suddenly stop the momentum around some of these changes.” [INT09: Social Sciences | Dinesh Wadiwel]

(ii) CONFUSING THE AUDIENCE?

ONE WELFARE SEEN AS REDUNDANT

Some respondents see One Welfare as redundant, as they feel that One Health already encompassed the ideas that One Welfare propagates.

7. One Welfare c) One Health and One Welfare

Those who indicated understanding One Health as a holistic concept that encompasses the health of animals and the environment often felt that One Welfare is redundant.

"These are the same things. Because I think One Health really includes One Welfare. These are basically the same things, but with different names. If you read the concept of One Health, it takes care of the welfare of humans, environment and animals already. So, why do we have two terms?" [INT21]

"If I look at the WHO definition of health, health is much more than the absence of illness. I think they call it: condition of physical and psychological balance. And this is very close to the One Welfare concept. We should define to what extent they do differ from each other. I would like to understand the One Health concept like the One Welfare concept. For me, a division between the two is difficult." [INT15]

"As I don't define health as the absence of a disease, I don't see any polarity between those two terms. What use is health if nutrition is not ensured? And if climate change threatens us? It depends on the definition of health, and it should be one where you define health as being more than the pure absence of disease." [INT27: Health | Imke Lührs]

MULTIPLE CONCEPTS ARE A DISTRACTION

Some respondents think that the One Health concept and the One Welfare Framework could end up being competitors and stifle the progress of either or both concepts. In essence, the argument is that implementing One Welfare is a distraction, confusing people rather than garnering their support.

"To be frank, right now, I imagine there will be more of a distraction rather than an added value. Because right now everybody is already talking about One Health. Let's not confuse people by introducing a new term." [INT19: Health | Renzo Guinto]

"It goes into the direction of inflation of notions. In science, we had that with the term multi-disciplinary. And then it had to be called inter-disciplinary and nowadays it is called trans-disciplinary work. Of course, there was a reason behind it. But the way many people used these terms and how they mixed them up... and this is the danger I see here, too. I would be happy with the One Health concept because this is something we should aim at. And health is not only defined by the absence of illness. It has a much broader spectrum and also includes healthy ecosystems. If that was the case, I would be happy with the concept." [INT15]

A single respondent suggested implementing One Health first and then focusing on One Welfare afterwards.

"My concern would be that even the smaller One Health concept – we are not fully embracing it yet. I think if we introduce a new one, it is going to be a bit confusing for people and they would take a step back. I would rather implement this new concept once we have the One Health concept fully adopted and everyone is working on it" [INT01: Health | Ghazi Kayali]

A single respondent remarks that policy-makers take a long time to adopt a concept and that introducing a further concept would stall policy work anew.

7. One Welfare

d) Suggestions for Advancing One Welfare

"My only concern with adding another acronym and another term is that it takes a little bit for those things to set demands into the mind of policy-makers. It took a few years for One Health to start being discussed in international policy platforms. Now, if somebody comes up with another concept, instead of One Health, it might take another few years before people start talking about it and implementing it. I honestly do not think there is a big difference if you call it One Health or One Welfare; what's most pressing to me is that the existing approach is fully developed without leaving any part behind, especially in terms of environmental risk prevention." [INT07: Environment/Climate | Moreno di Marco]

d) SUGGESTIONS FOR ADVANCING ONE WELFARE

At the end of the interview, the respondents could make suggestions for advancing the One Welfare Framework. Most often – by some respondents – educating the public was suggested. Additionally, the role of government in enacting legislation was addressed and the need for international oversight voiced.

EDUCATING PEOPLE, COMMUNICATING OF CONCEPT AND BACKING OF SCIENTIFIC DATA

Some respondents feel that educating and disseminating the concept to political leaders as well as the general public is vital. People being knowledgeable of the concept at the local level could also improve the chances of the concept reaching implementation. In a similar vein, convincing political figures on the concept's merits would furthermore improve the chance for scientific funding and the concept being pushed higher up on the political agenda.

"I think the easiest and the first step into any of these types of strategies is making sure people hear it, people know the term, people are speaking more of this term. I have heard it anecdotally. I'm sure many of my colleagues may not have heard it. And I can probably bet many people that are not in this field probably have never heard of it. So, this is something that you want to promote more through advertisement [...] Right now, it's such a new term that they have no idea. You can't expect political leadership to buy in something that their constituents or those that they serve haven't even heard, because they're not going to lobby for it. [...] The first step is ensuring that at the local level, individuals are familiar with the term, understand what it means, why it's important, how it impacts them, and then, getting to that political buy-in for that political will, for that financial support, for moving the agenda further. And when they see that even their constituents and those that they serve are now advocating for it, then it becomes a better push." [INT06: Health | Syra Madad]"

I think education, definitely. I'm talking about the young people. Educating them on why we need to care for our environment otherwise the environment will not care for us. Education is a huge, huge key. And every institution and every educational institution (is key) because many of the rich institutions, which you have to pay to go to and that only the rich can afford, don't teach any of this. All they teach is related to economic gain and scores. People need to walk the talk. If people are going to talk about One Welfare, then they need to walk that talk." [INT26: Social Sciences | Susan Chiblow]

It is also suggested that science and data must be generated to further make a case for One Welfare. The thinking behind this notion is that policy-makers would

7. One Welfare

d) Suggestions for Advancing One Welfare

respond well to facts and data, especially in terms of the concept's interdisciplinary benefits. However, the information garnered must be communicated beyond the bubble of scientific discourse. Furthermore, funding for scientific research needs to be secured.

"The first step before all of that is working in an interdisciplinary manner to collect the facts and the data to support this type of argument because I do think people respond to facts. Giving them examples of how this is true, so that they can follow that pattern and look for it in their everyday lives, I think, is really important. And this has not been an area that has been as widely researched or as well funded as other types of work have been. [...] I do think there are real facts and data that support that type of an argument. First collecting those, and then figuring out how to present them to the public in a way that can change people's thinking and have those people then change other people's thinking, and eventually together they can start to make important change." [INT24: Law | Ann Linder]

"I would recommend to research different fields that can support. We need knowledge; we need technology. More hardcore science in technologies, but then also more social science about how we can spread and foster adoption of such technology. How we can adopt better instruments for spreading technology of practice and so on. [...] Work on finance and promote research in different fields. [...] Make sure that they also include experts or people that can communicate. They can somehow talk between the scientists and the civil society or the scientists and the companies involved and investors, making sure this research doesn't stay in a bubble." [INT17: Economics | Martina Bozzola]

LAWS AND REGULATIONS

A few respondents discuss the role of governments, highlighting that governments can easily implement laws and regulations that are compliant to One Welfare. Living conditions of animals could thus be bettered quickly. Furthermore, industries that produce animal products could also be discouraged or stopped.

"Governments can make laws that ban mink farming or ban wildlife farming or change the way farmed animals are housed, for example. There are so many things you can do with the stroke of a pen that would change policy, improve welfare for all animals. [...] I don't know if it's easier to convince governments to do it; but having laws about banning fur farming at the stroke of a pen, you can change everything for those animals." [INT02: Animal Health | Jim Desmond]

Improved animal welfare and regulations on reducing animal stocks would raise the cost of animal products. In a similar vein, tying animal agriculture industry to climate change discussions could promote higher taxes on animal products at the EU level. At the national level, a change to value added tax is said to be necessary to make plant-based products cheaper, while making animal products more expensive and thus phasing them out.

"Animal welfare would also promote cost honesty and on a European level. I would definitely reshape agricultural policies in the clear direction of reducing animal stocks. [...] A carbon tax on a European or national level to tax foods – with a worse ecological footprint in terms of greenhouse gas emissions – higher, and in exchange introduce relief in other areas so that nobody is additionally burdened. You reward with economic measures whatever is ecological and

7. One Welfare

d) Suggestions for Advancing One Welfare

protect us from pandemics and “punish” whatever is the opposite. [...] When you get to the lower levels, like on national levels, I’d say you’d have to change the value added tax, e.g. plant-based milk alternatives currently have a higher tax than dairy milk, so for health and ecological reasons, you could invert that, for health reasons and for animal well-being.” [INT10: Nutrition&Food / Kurt Schmidinger]

DIFFERENT POLICY LEVELS PLAY A ROLE

Very sporadically, respondents feel that different policy levels are called for to promote One Welfare. However, the global level is seen as especially vital for all nations to be involved and become a part of the change. At the same time, respondents also indicate that national governments may be reluctant to hand over their competencies.

“The question is: Which institutions would be responsible, are those supranational organizations, like UNO or EU? I think, just now, the understanding is that certain problems can only be solved globally, and it would be desirable that the UN gets more competencies granted, and the national governments would have to hand over those competencies. We can see, again and again, in the EU, just how difficult that is. But it is the only way how it can be discussed - where everybody is on board and not only the Western industrialized nations are responsible.” [INT08: Social Sciences / Mieke Roscher]

ACKNOWLEDGE INDIGENOUS PEOPLE IN DECISION-MAKING

A single respondent stresses that it is important to include indigenous people in the decision-making arena.

“Give us our land back! Give us back our lands and work with us when we are making our decisions on what can happen on our lands. [...] at least acknowledge and respect and bring them back into the decision-making arena.” [INT26: Social Sciences / Susan Chiblow]

COLLABORATING WITH ONE HEALTH PROPONENTS

A single respondent feels that joining forces with proponents of the One Health concept is necessary and warns that the two concepts should focus on collaboration rather than competition.

“I do see that a welfare movement can be connected with the One Health movement as well, and they will have a lot of collaboration. There’s nothing wrong in the welfare agenda being promoted by one group of people and the One Health agenda by another group; both should have strong alignment in making change with the goal of having a safe planet. There is no conflict between these two approaches, and they can complement each other very well. The ultimate goal is to have a sustainable planet for which we need work for the welfare of all species.” [INT18: Animal Health / Nitish Debnath]

IV. CONCLUSIONS

The 29 in-depth interviews on the future of human-animal relationship after COVID-19 with renowned international experts from several disciplines have provided valuable insights regarding a potential international treaty on pandemic prevention.

Overall, the majority of respondents view animal welfare as having a clear influence on the prevention of pandemics. Although human contact with wild animals or their pathogens is seen by the respondents as the root cause of zoonotic pandemics; the animal agriculture system and poor animal welfare – especially relating to farm animals – are regarded as a catalyst or influencing factor that could benefit their spread.

In order to mitigate the risk of another pandemic, respondents favor the reduction of behaviors that interfere with wild animal habitats and a decrease in consumption of animal agriculture products. Further suggestions include the need for an interdisciplinary approach to pandemic prevention and a look at the very high costs associated with the pandemic, which outweigh the costs of preventative measures.

The One Health concept – which is an interdisciplinary approach to achieve better health outcomes – was discussed during the interviews. The concept is known by the majority of the respondents, although the degrees of familiarity varied. The concept garnered some criticism in terms of it being anthropocentric, as it is said to mainly focus on human health aspects and neglect the health of the environment and animals. However, interviewees who had worked closely with the One Health concept often lauded it as being holistic. Regardless of which perspective prevailed, various factors impeding the implementation of One Health were voiced: economic reasons and special interests, the siloed nature of the different fields within One Health and siloed government structures, a lack of knowledge and a lack of funding. In order to advance a more holistic approach, those issues need to be tackled.

The One Welfare Framework is another holistic global health approach discussed in the interviews. “One Welfare” builds on the One Health concept and is a way to recognize the many social interconnections between human welfare, animal welfare and the integrity of the environment. The initial impression of One Welfare is primarily positive. However, due to many respondents being unfamiliar with the

framework, the responses are often slightly vague. Nevertheless, respondents appreciate the concept's multidisciplinary outlook.

The respondents largely feel that there is a need for One Welfare to complement One Health and that introducing a second concept will not infringe on the progressing of either. However, some respondents feel that One Health is sufficient and that One Welfare might be a distraction. If these experts already have difficulties differentiating between the two approaches, it holds utmost importance to clarify where and how the One Welfare Framework complements One Health.

In order to advance the One Welfare Framework, the experts mostly stressed the need for educating the public about the framework, which includes scientific evidence to bolster its benefits. Additionally, the role of governments is mentioned, as they can implement laws and regulations that are compliant to the One Welfare Framework and which could quickly improve the living conditions of animals. Additionally, governments could influence the price of food through either promoting plant-based products – e.g. through tax benefits – ending advertising of animal products, or through stricter regulations on animal husbandry.

At the core of the future study is the discussion of three fictitious scenarios that might be part of an international agreement on pandemics. The scenarios range from a status quo-oriented approach with little changes (Scenario 1: "Symptom Control") to a very ambitious approach with many changes (Scenario 3: "Prevention"). For each scenario, the experts were asked for their assessment of its effectiveness for preventing future pandemics and its likelihood of being part of an international treaty on pandemic prevention.

Scenario 3 is rated as being the most effective for preventing future pandemics because it leads to less contact between humans and animals by phasing out intensive animal husbandry (ending factory farming), reducing the consumption of animal products, banning wildlife trade and fur farming, and addressing land use. Aside from these specific measures, it is also mentioned that this scenario employs a holistic approach and addresses the root causes of a pandemic.

As unanimously as this scenario is seen as being the most effective, it is also seen as the least likely because it is perceived as demanding too much change. Being the least likely scenario is primarily explained with economic interests working against it combined with missing political will and cultural/behavioral aspects that prefer the status quo. At the same time, a few experts perceive the pandemic as an enabler that makes this scenario more realistic to achieve.



To advance this scenario, some experts suggest a stronger push for plant-based products and cellular agriculture, e.g. by the government investing in research and development for plant-based alternatives or providing financial incentives to consumers (lower taxes) on plant-based products. Additionally, it is mentioned that ultimately consumers can support that change by opting for plant-based products. Other suggestions for advancing this scenario include coalition building – e.g. with the climate change movement – and campaigns to educate the public about this topic.

In addition to being effective for preventing future pandemics, this scenario is also perceived as having multiple benefits for animal welfare and human well-being. Regarding animal welfare, it is stressed that this scenario reduces industrial animal agriculture and bans several high-risk activities such as wildlife trade. In terms of human well-being, the positive aspects cover several areas but mainly focus on health implications based on eating less meat, safeguarding the environment, and fighting climate change.



V. REFERENCES

- David S. Rosenthal Center for Wellness and Health Promotion Harvard University Health Services. (n.d.). *Your Wellbeing*. (Harvard University) Retrieved October 2021, from Wellness: <https://wellness.huhs.harvard.edu/environmental>
- Friends of the Global Fund Japan. (2021, August). Launching a Pandemic Financing Facility: Three Proposals & Their Implications for the Global Fund. *FGFJ Issue Briefing*, 7. Retrieved from https://www.jcie.org/wp-content/uploads/2021/08/FGFJ_issue_brief_PPR.pdf
- One Welfare. (n.d.). *About One Welfare*. Retrieved October 2021, from One Welfare: <https://www.onewelfareworld.org/about.html>
- Pinillos, R. G., Appleby, M. C., Manteca, X., Scott-Park, F., Smith, C., & Velarde, A. (2016). One Welfare - A Platform for Improving Human and Animal Welfare. *The Veterinary Record*, 179(16), 412–413. doi:<https://doi.org/10.1136/vr.i5470>
- Rebecca, G. P. (2018). *One Welfare: A Framework to Improve Animal Welfare and Human Well-Being*. Wallingford, United Kingdom: CAB International.
- The Coalition for Epidemic Preparedness Innovations. (2020). *COVAX: CEPI's response to COVID-19*. Retrieved October 2021, from CEPI: New vaccines for a safer world: <https://cepi.net/covax/>
- The Global Coalition for Epidemic Preparedness Innovation. (2021). Transcript: CEPI investment case launch. *The Urgency of Now: Turning the Tide Against Epidemic and Pandemic Infectious Diseases* (p. 20). CEPI. Retrieved from https://cepi.net/wp-content/uploads/2021/03/CEPI_IC_Launch_Event_Transcript_100321.pdf
- World Health Organization. (2017, September 21). *One Health*. Retrieved October 2021, from World Health Organization: <https://www.who.int/news-room/q-a-detail/one-health>