

SUPPLEMENTARY MATERIALS

For analysis of survey “COVID-19: Where do we go from here?”

METHODS

In spring 2020, Future Earth and Imperial College of London’s Grantham Institute on Climate Change and the Environment, and the Sustainability in the Digital Age initiative conducted two parallel global surveys. One targeted people connected in some way to studying or taking actions to advance sustainability using a Survey Monkey tool, which we refer to here as the Sustainability Community. The other was targeted to a more general population across 29 countries using Google surveys - we refer to this group as General Population. The surveys were open between March 29th and April 19th, 2020. The survey to the Sustainability Community was circulated by email and social media channels (Twitter, Facebook, Instagram) through Future Earth and The Grantham Institute for Environment and Climate Change networks and directed emails to professional networks of the project advisory team. Surveys to the General Population were sent to countries across Latin America, Sub-Saharan Africa, South and East Asia, Europe, and North America, and translated into local languages. All survey responses were anonymous, but included demographic questions on gender, age, country and area of work. Together, 2359 people provided responses to the two surveys: n = 1334 from the Sustainability Community and n=1025 from the General Population. We excluded responses where respondents provided unvarying answers across all questions on trends in societal features (i.e. 1,1,1,1,1 or 2,2,2,2,2) as non-informative, leaving 2224 usable answers with 1323 from the sustainability community and 901 from the general population.

Survey Structure

The two surveys asked the same ten short-answer questions to the Sustainability Community and General Population using five-point Likert scales. Respondents were asked to rank: i) their level of optimism with regards to their quality of life in three years’ time, ii) their expectation of shifts in trajectory of the world along five societal: the degree of economic interdependence among nations, centralization of governance, extent of digital surveillance, level inequality and the size of our ecological footprint over the next three years, and iii) their degree of support for the use digital technologies in crises responses and to tackle the climate crisis, and the strength of societies trust in digital technologies in three years’ time. For questions on the trajectory of change in the Survey Monkey platform respondents were presented with a slider-bar for each societal feature and asked to indicate along a spectrum from -100 to 100 the direction and degree of change in each system, with 0 representing current state. Responses to these questions were subsequently binned (≤ -60 = ‘Much less’, -59 to -10 = ‘Less’, -10 to 10 = ‘No change’, 10 to 60 = More, $60 \geq$ = ‘Much more’) to make them comparable to five-point Likert responses in the Google Survey platform.

In addition to these short-answer questions, the survey to the Sustainability Community included additional long-answer questions to provide respondents an opportunity to elaborate on particular topics related to changes (full copy of the survey below). Long-answer questions asked respondents to envision how the future might unfold from the COVID-19 crisis in three years’ time and: i) provide an hopeful and expected newspaper headline and description of this future, ii) describe at least one new opportunity which may arise as a result of the current COVID-19 crisis to drive positive societal transformation to be more globally resilient and sustainable, iii) identify underlying societal inequities and inequalities the COVID-19 crisis has

highlighted, and iv) to identify the top five global risks that are most likely to have major consequences for society in the next 10 years from a list of 30 global risks identified by the World Economic Forum's Global Risk Report 2020 (WEF 2020). For long-answer questions survey respondents were provided the option to respond in the language of their choice.

Analysis

Analyses of data from the two surveys were carried out separately. For short answer questions, responses were kept in ordinal scale and the frequency of responses tabulated to examine the distribution of response. In a limited number of cases, Likert scale responses were converted to a numeric scale from 1 to 5 in order to calculate mean responses and standard deviations within survey populations but were not used for statistical comparison between the two surveys. All quantitative analysis was performed in the statistical software R-project v3.6.1 and RStudio v1.2.1335.

Responses to long-answer questions were translated into English as necessary and analysed using Qualitative Content Analysis QCA methodology with the software program MaxQDA 2020. Thus far, the analysis has focused on responses to questions about expected and hopeful newspaper headlines in three years' time. An initial round of coding was carried out by three independent coders and compared to establish a common coding system. Overall, most responses fell into the structure of identifying a change in a system (e.g. the environment, economy, health, food production, governance, technology, etc.) and the driver of this change (e.g. new policies, behaviours, cooperation, conflict, access to information, etc.). The coding system developed led to each response being defined by an established set of 'systems' impacted and 'drivers', as well as for the scale at which the occurred (i.e. Local, Sub-national, National, Regional, Global, Cross-Scale). A response could be coded for multiple systems, drivers, and scales as appropriate. Only the primary driver(s) were coded for a single response, however, even if multiple drivers were mentioned. The second and third rounds of coding focused on refining in particular the drivers' categories in an iterative process including two additional scientists. Finally, a fourth round of coding was conducted to check each code before finalizing.

Survey respondent demographics

In total we had 1334 people from the Sustainability Community start the survey and respond to at least one question. Most of the respondents for this survey were based in Europe (45%) or US & Canada (27%) with lower representation across regions of the Global South (Asia: 11%; Sub-Saharan Africa: 8%; Oceania: 4.5%; Latin America: 4%; North Africa & Middle East: >1%). Respondents primarily worked in the fields of Environment and Energy (43%), Education (16%) or Humanities and Society (8%).

The Google Surveys of the General Population (n =1025) had more even representation across the world with 39% from Latin America, and between 9-15% from each of the other major regions. Respondents primarily worked in the fields of Business and Technology (18%), Education (12%) and Medicine and Health (11%), however 50% of respondents indicated that they work in 'Other' areas not listed in the survey question. An approximately even number of men and women participated in both surveys.

FULL COPY OF THE SURVEY

WHERE DO WE GO FROM HERE?

GLOBAL RISKS AND OPPORTUNITIES FOR RECOVERY AND TRANSFORMATIONS FROM COVID-19 CRISIS.

With the COVID-19 health crisis, the world is experiencing unprecedented disruption to daily lives and the social, economic and governance systems that support them. While the immediate priority is to protect the most vulnerable populations and sectors, we - as a global society - must not overlook the opportunities that crises can provide to re-imagine and rebuild our future.

Over the coming months and years, choices will be made and massive amounts of resources will be invested to respond to and recover from this crisis. Many of these decisions will shape society for decades. At this early stage it may be helpful to start considering: What are the biggest opportunities for transformation to a more resilient, equitable, and sustainable world? How do we want the economy, society, and governance to evolve? How can we most effectively leverage the digital sector for managing global risks, while managing potential threats to privacy, equity, and democratic rule? With this survey, Future Earth, The Grantham Institute for Climate Change and Environment, and their partners seek to spark critical reflection on the challenges, but also the opportunities that this global crisis presents, and to contribute to what will soon emerge as a global conversation on where we go from here.

We invite you to provide your perspective through this survey that takes **approximately 15-20 minutes** and which is organized into **3 parts**:

- 1. Personal outlook**
- 2. Strategic Foresight**
- 3. Role of digital technologies**

The results may offer important insights on pathways toward a more globally resilient, sustainable, and equitable society. Data collected from this survey will remain anonymous and will only be used for research purposes. If you have any questions or comments, please contact sylvia.wood@futureearth.org.

Demographic Questions:

Before we get started, tell us about yourself...

In what country are you based? [Drop down list of all world countries]

What gender do you identify with most? [Male; Female; Other]

What age range do you fall within? [<18 years, 18-29 years; 30-39 years; 40-49 years; 50-59 years; >60 years]

In which area do you work? [Drop down list of options]

Medicine and public health

Business and Industry

Environment and Energy

Humanitarian services

PART 2: STRATEGIC FORESIGHT

Tell us what you think the world could look like in the coming years...

For the following long-answer questions, responses in English are suggested. However, if you prefer to enter responses in a different language, please select the language from the drop-down menu.

[Dropdown menu of 10 major languages]

Q4: Please describe how you think the future might unfold from this current crisis by imagining newspaper headlines for the following situations. For each please provide a few sentences to describe the key points of the accompanying article.

a. **In 3 years from now:** What could be a plausible headline you *hope* to see? Please describe the key points of this article.

[Open text box]

b. **In 3 years from now:** What is a headline you think is *most likely*? Please describe the key points of this article.

[Open text box]

Q5: RECOVERY|TRANSFORMATIONS: Please describe at least one new opportunity, which may arise as a result of the current COVID-19 crisis, for bold actions to drive positive societal transformations toward a more globally resilient and sustainable world?

1st Opportunity

2nd Opportunity (optional)

Q6. What underlying societal inequities and inequalities has this crisis made more glaringly apparent? How can these be addressed in our efforts to recover and transform from this effort?

[Open text box]

Q6: Which *global risks* are the most urgent for society to address in the next few years?

The 30 risks listed below were used in the 2019 Future Earth Global Risks Scientists' Perception survey and WEF 2019 Global Risk Report. We would like to track how perception of global risks has changed during the current crisis.

Please select up to a **maximum of five risks from the 30 global risks** organized by category (*Environmental, Societal, Geopolitical, Technological, Economic*) or provide alternative suggestions if you select 'other'.

ENVIRONMENTAL

- Extreme weather events
- Failure of climate change mitigation and adaptation
- Major biodiversity loss and ecosystem collapse
- Major natural disasters
- Man-made environmental damage or disaster

SOCIETAL

- Failure of urban planning
- Food crises
- Large-scale involuntary migration
- Profound social instability
- Rapid and massive spread of infectious disease
- Water crises

GEOPOLITICAL

- Failure of national governance
- Failure of regional or global governance
- Interstate conflict with regional consequences
- Large-scale terrorist attacks
- State collapse or crisis
- Weapons of mass destruction

TECHNOLOGICAL

- Adverse consequences of technological advances
- Breakdown of critical information infrastructure and networks
- Large-scale cyber-attacks
- Massive incident of data fraud/theft

ECONOMIC

- Asset bubbles in a major economy
- Deflation in a major economy
- Failure of a major financial mechanism or institution
- Failure/shortfall of critical infrastructure
- Fiscal crises in key economies
- High structural unemployment or underemployment
- Illicit trade
- Severe energy price shock (increase or decrease)
- Unmanageable inflation

[Other – please specify]

[Other – please specify]

[Other – please specify]

PART 3: ROLE OF DIGITAL TECHNOLOGIES

Tell us about your thoughts on the opportunities and challenges of leveraging digital technologies in managing global crises, such as COVID-19, and enabling transformations to a more resilient, equitable, and sustainable world.

Q7: Governments around the world are increasingly leveraging digital surveillance tools to help stem the spread of the coronavirus. Do you support the use of digital surveillance in times of emergencies if it can help save lives?

1. Strongly NOT Supportive
2. NOT supportive
3. Neutral
4. Supportive
5. Strongly supportive

Please feel free to provide conditions and qualifying comments. [Open text box]

Q8: Do you support the use of digital surveillance to more effectively tackle the climate crisis, including mitigation and adaptation (for example, by tracking patterns of travel, diet, consumption - and associated carbon use, surveillance of individual carbon footprints, or other such measures)?

- 1) Strongly NOT Supportive
- 2) NOT supportive
- 3) Neutral
- 4) Supportive
- 5) Strongly supportive

Please feel free to provide conditions and qualifying comments. [Open text box]

Q9: Increasingly more aspects of our day-to-day social and economic systems are moving online (i.e. virtual interactions necessary to keep up to date with work, shopping, social connections, news and other pursuit of knowledge, and other activities). Do you expect that people's trust in their online interactions will be strengthened or diminished over the next 5 years?

- 1) Strongly strengthened
- 2) Strengthened
- 3) Neither strengthened nor diminished
- 4) Diminished
- 5) Strongly diminished

Q10: As more and more aspects of our social and economic systems move online and are mediated by artificial intelligence, what are the most important actions needed, by whom, to ensure this societal shift to even greater use of digital technologies helps to support the development of a more resilient, sustainable, and equitable society?

Please identify at least one action and responsible party.

1st Action Needed
2nd Action Needed (Optional)

Taken by whom?
Taken by whom? (Optional)