Monitoring knowledge, risk perceptions, preventive behaviours and trust to inform pandemic outbreak response

SURVEY TOOL AND GUIDANCE

Rapid, simple, flexible behavioural insights on COVID-19

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1. Introduction

This document provides guidance to Member States in the WHO European Region that wish to conduct behavioural insights studies related to COVID-19.

The COVID-19 pandemic outbreak is placing an overwhelming burden on health systems and authorities to respond with effective and appropriate interventions, policies and messages.

A poorly timed and managed **pandemic response or transition phase** can threaten the gains collectively achieved. The pandemic and its restrictions may have affected mental and physical well-being, social cohesion, economic stability as well as individual and community resilience and trust (1-5).

In this complex context, understanding how, why and the context in which humans and communities respond allows to

1) anticipate unwanted scenarios and initiate mitigating measures; and
2) implement pandemic response measures that are better informed, situated, accepted and thus more effective.

Population surveys can explore perceptions, acceptance of restrictions, mental and physical health, behaviours, information needs, misperceptions and more.

WHO Regional Office for Europe and partners are offering Member States a tool to gain such insights which

1) is evidence-informed;
2) can be rapidly and regularly applied;
3) is simple and flexible to adjust to the changing situation;
4) follows high ethical standards.

A few countries have rapidly instigated studies to gain such insights, and more countries are urged to prioritize such efforts to inform and support other response measures.

The approach presented in this guidance document was developed based on a framework initiated by the University of Erfurt, Germany, German national health authorities and others (Box 3).

This guidance document introduces:

- guidance on the recommended process and steps
- a sample methodology
- advice for obtaining ethical clearance
- a suggested sample questionnaire (Annex 1)
- codes for data analysis and establishing a protected website for presentation of findings (Annex 2).

WHO Europe's Insights Unit and Health Emergencies Programme are offering support to countries for implementation. We urge all users of the tool to let us know their plans so that we can coordinate and share. This way, we can prevent that two institutions in one country are working in parallel on the same type of study.

Please contact Katrine Bach Habersaat (habersaatk@who.int) or Martha Scherzer (scherzerm@who.int).

Box 1: Suggested approach to behavioural insights research for COVID-19

Any country interested may use the questionnaire (Annex 1) to collect data regarding the public's risk perceptions, behaviours, trust, knowledge and other variables. This data is collected via online panels, and a national research group or private company can be engaged to collect the data. Using a set of codes (Annex 2) the findings can be automatically and immediately transferred to a protected webpage, if desired (examples of what this looks like in Figure 1). The webpage can be easily developed as a subpage on an existing website as decided by the implementing country. This allows national pandemic response groups to use the findings to inform pandemic response measures. In more detail:

- It is suggested to conduct a serial, cross-sectional study: Data can be collected repeatedly, e.g. weekly, with different participants so the status quo can be assessed over time.
- Repeated assessment of the same core variables allows analyzing changes over time. It also allows comparisons across countries if desired.
- Changing some variables allows adaptive research to a dynamic situation (e.g. asking for the acceptance of hand washing may be more important in the beginning while adding acceptance of closing schools or a lockdown may be relevant later in the epidemic).
- This allows in-time and adaptive monitoring of the variables (such as risk perceptions, knowledge, trust, behaviours and more) – and identifying changes over time to assess the relations between them.
- Variables can be adapted to different countries, target groups, cultural contexts and to the evolving situation and epidemiology over time. Randomization of answer options can be made where suitable.
- An automated data analysis website ensures immediate data analysis and provides fast access to the results (commented code for data analysis and website in Annex 2).
- Changes in risk perceptions or knowledge can be assessed over time.
- Data on acceptance of new response measures can be made rapidly available.
- Misinformation or possible stigma can be identified as they emerge.
- National teams using the tool are urged to work in partner coalitions to discuss insights gained and implications for outbreak response interventions, policies and messages.
- Results can be made available to the media to support high quality and responsible reporting.

Box 2: Who is involved?

- National or subnational health authorities will lead the study in their country.
- Research institutions may be engaged to conduct or support the study by health authorities. They may also take the initiative, approach health authorities and suggest collaboration.
- WHO Regional Office for Europe developed this guide and are offering support to European Region Member States for coordination or implementation.
- University of Erfurt, Germany originally developed the guidance and questionnaire and supported the adaptation made in this document. All documents were made available at no cost.

Box 3: Acknowledgements

The following researchers and authorities were involved in developing this guidance

- Universität Erfurt (Cornelia Betsch (PI), Lars Korn, Lisa Felgendreff, Sarah Eitze, Philipp Schmid, Philipp Sprengholz)
- Robert Koch Institut (Lothar Wieler, Patrick Schmich)
- Leibniz Institute for Psychology Information (Michael Bosnjak)
- Bernhard Nocht Instiute for Tropical Medicine (Michael Ramharter)
- Science Media Center (Volker Stollorz)
- Yale Institute for Global Health (Saad Omer)

2. Process: getting started

Figure 2 describes the suggested process of adapting the tool presented in this guidance document.

For steps marked with (*) in Figure 2, standard materials can be found in this guidance document:

- standard guidance for adaptation
- questionnaire
- commented codes for data analysis website (Annex 2)

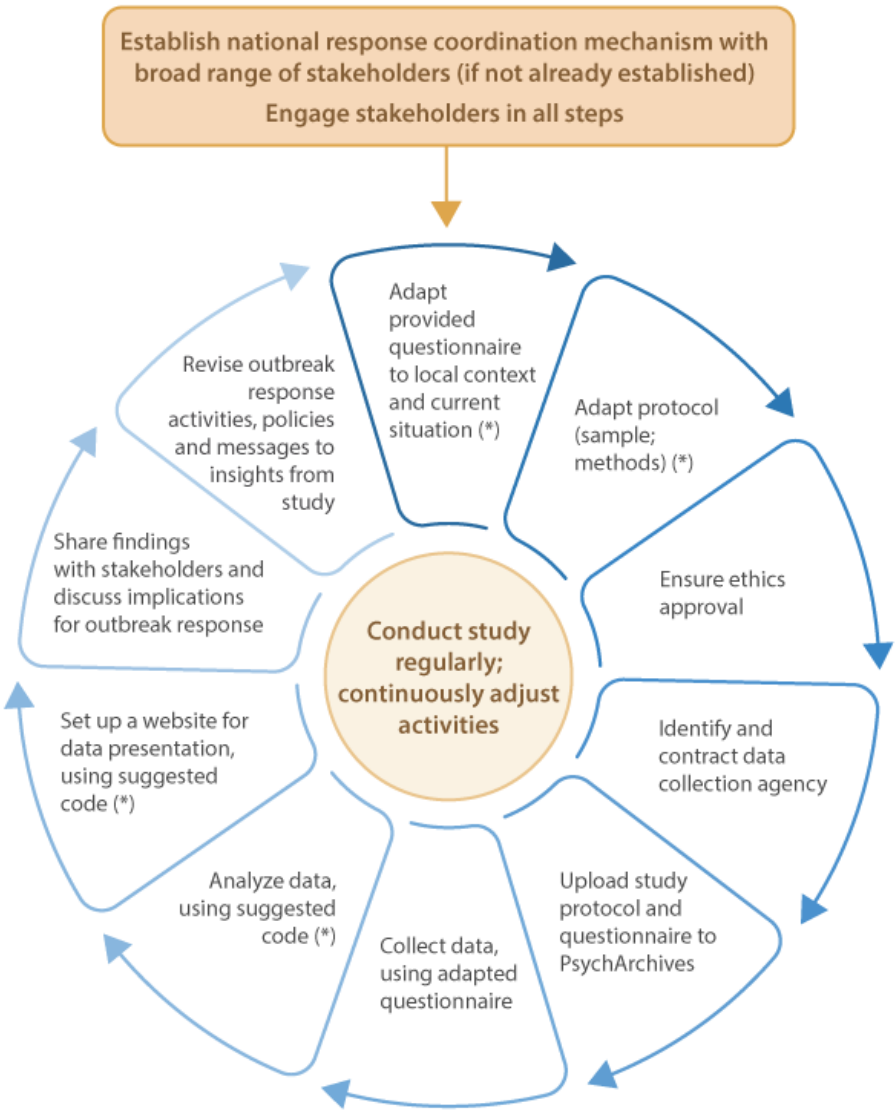
Key steps include:

- Reaching out to WHO Regional Office for Europe for coordination and possible support (habersaatk@who.int and scherzerm@who.int).
- Liaising with key partners in the country. If you are a researcher: notifying country health and pandemic response authorities of the interest in using this tool and suggesting collaboration.
- Using current document (and the online version available above) to prepare country action plan with timeline plus roles and responsibilities
- Considering if the use of the tool will impede any national emergency response efforts. If so, please contact the WHO Regional Office for Europe before proceeding for guidance and support
- Deciding on which stakeholders to involve in the planning and which stakeholders should get access to the data.
- Adapting the guidance and questionnaire to the national context, preferably consulting with the local community and key stakeholders to ensure clarity, applicability and cultural sensitivity (Annex 1).
- Seeking ethical clearance.
- Deciding on the data collection mechanism (online, Computer-assisted telephone interviewing (CATI), Computer-assisted personal interviewing (CAPI), mixed-mode).
- Deciding on the frequency of data collection (e.g. weekly). This decision should be made by country-level authorities based on criteria including the phase of the pandemic, ability of authorities to incorporate data and adjust response accordingly and the available human resources.
- Deciding on the sample. A cross-sectional sample is suggested (e.g. representative for age, gender, district – with a minimum of N = 1,000). A final sample size may be adjusted in consultation with the data collecting agency to be appropriate for the country.
- Entering an agreement with a data collector, e.g. a national statistics agency, an academic institution or a market research agency.
- If desired and appropriate, posting the protocol and questionnaire on PsychArchives.org: https://hdl.handle.net/20.500.12034/2392
- Collecting data: surveys are generally made available online for 38-48 hours. Ideally, any possible telephone-assisted data collection would happen in the same timeframe.
- Setting up an automated data analysis website for presentation of the data (using any website preferred and the codes provided in Annex 2). This website can use the open source R statistical package to analyse data and produce visual representations that can be easily reviewed and understood by a wide audience.
- Sharing results with national authorities who acknowledged their buy-in at the beginning: once results are available, we suggest regular meetings between all partners to share findings and discuss

implications for pandemic response. As appropriate, the WHO Country Office or Regional Office for Europe will be available to participate in these meetings, with the clear understanding that the data and subsequent decisions belong to the country, to provide input on the interpretation of data and how this might inform national pandemic response. Discussion includes possible actions to be taken in response to results and changes being seen over time and planning for a possible new round of data collection.

Please note that for suggested methodology, ethical clearance, sampling and more, there is detailed guidance below.

Figure 2: Recommended steps and process



Upload link: http://dx.doi.org/10.23668/psycharchives.2782

(*) This guide provides supporting materials for this step (questionnaire, guidance, code).

3. Standard Approach

The following is the recommended standard approach for using this tool. The pandemic situation is evolving rapidly, and the most current version of the standard approach can be shared by WHO as an adaptable word version. Please contact Katrine Habersaat (habersaatk@who.int) or Martha Scherzer (scherzerm@who.int).

Flexibility and adaptation

As the COVID-19 pandemic evolves and the epidemiological and response situation rapidly changes, the study must be continuously updated so that the questions asked reflect the situation and provide the necessary information to shape effective and appropriate outbreak response measures and next steps.

National teams using the tool are encouraged to draw on the existing evidence-base from previous outbreaks and epidemics and ethical frameworks for decision making in public health (17,18) as findings emerge.

Aims and objectives of the study

The study will be initiated by health authorities in individual countries to gain insights into risk perception, knowledge, trusted sources of information, attitudes toward pandemic response initiatives and other variables **to inform COVID-19 outbreak response measures, including policies, interventions and communications**.

The primary objectives are to:

- Monitor variables that are critical for population behaviour to control transmission of the novel coronavirus, including risk perceptions, knowledge, self-efficacy, confidence in institutions, behaviours, rumours, affect, worry, resilience, trust in/use of information sources and more.
- Document changes over time in these factors to understand the effect of the pandemic process, new developments, events or measures taken.
- Monitor possible issues related to misinformation, hoarding or stigma as they emerge, to allow early response.
- Identify relationships between variables to identify levers for effective and appropriate responses.
- Explore the relationship of psychological variables (e.g. worry, resilience, trust, affect) with the epidemiological situation and the events and measures taken.
- Identify gaps between perceived and actual knowledge.
- Evaluate the effectiveness of pandemic response measures, and the acceptance and effectiveness of policies and restrictions implemented, including the easing of such restrictions.

The secondary objectives are to:

- Contribute to post-outbreak evaluation, thereby contributing to the continued regional/global efforts to better understand mechanisms of crisis response.
- If additional research capacity is available, the data can be triangulated with data on media reporting, COVID-19 cases and other.

- If additional research capacity is available, the data can be triangulated with data on media reporting, imported or confirmed cases, etc.: The relationship between psychological variables and characteristics of the outbreak situation can be explored (i.e. how closely the perceived risk mirrors reported cases, relative import risk, media reports). Whether it is possible to identify the emergence of certain misinformation as a correlate of risk perceptions can also be explored.

This approach allows a citizen-centred approach where insights into population perceptions and behaviours inform COVID-19 actions, alongside epidemiological data and considerations of economic, cultural, ethical, structural political nature and other.

Study methods

The study method is decided upon by the national pandemic response authorities based on feasibility and appropriateness in the country. A 15-20 minutes online questionnaire in a serial cross-sectional design with multiple data collections is suggested as a standard approach (i.e., each sample will consist of different participants). Computer-assisted telephone interviews (CATI) surveys can be considered as additional or alternative data collection methods in countries where access to computers or smartphones is less widespread. For as long as social distancing is recommended, we do not recommend household surveys.

This is an observational study with voluntary participation in the general population, with expected low risk for participants. Potential risks identified include only the inconvenience of the time taken to respond to the survey, and given the current restrictions people face, many individuals currently have more available time. The variables and information requested does not allow to identify specific ethnic or disadvantaged population groups. Due to strict data protection measures, any risk related to non-anonymous publishing of data from the survey is considered very low, and the personal harm for the individual respondent related to such unlikely event is also considered low due to the less sensitive nature of the responses provided. Benefits include the sense of contributing and being able to participate in shaping the country's pandemic response.

It is suggested to collect data repeatedly (e.g. weekly or adapted to the epidemiological situation). This will allow to:

- identify developments over time (e.g. a decline in trust, or a decline in motivation to follow recommended behaviours);
- Identify new issues as they emerge (e.g. related to conspiracy theories, new misperceptions, stigma against certain groups or other) and address these;
- Detect effect or adverse responses to new restrictions, messages or actions taken.

Note that the cross-sectional design will not allow the assessment of actual causal relations and will only be snapshots of a current state of the public perceptions and behaviours.

In case of unexpected developments or new outbreak response measures implemented, pandemic response authorities may decide to change the time frame between the data collections.

If the survey is conducted repeatedly, it is advised to ensure a system to avoid participants to respond to the survey more than once. E.g. ensuring that only participants with a different ID can participate in

subsequent surveys. This procedure ensures both anonymity of participants and identification of duplicates.

A longitudinal panel would be an alternative to a serial cross-sectional design. This would mean asking the same participants repeatedly. It is not recommended to ask participants to fill in the same questionnaire every week, as answering the questions will potentially influence the answers given.

Variables

Variables being surveyed include the following (see Table 1 for details):

- Socio-demography
- Risk group
- Self-assessed knowledge
- Knowledge symptoms, treatment (*)
- Knowledge incubation
- COVID-19 risk perception: Probability and Severity
- Preparedness and Perceived self-efficacy
- Knowledge and self-assessed adherence to prevention measures (*)
- Prevention – own behaviours (*)
- Affect
- Trust in sources of information (*)
- Use of sources of information (*)
- Frequency of Information
- Trust in institutions (perceptions) (*)
- Policies, interventions (perceptions) (*)
- Conspiracies (perceptions)
- Resilience (perceptions)
- Fairness (perceptions)
- Lifting restrictions (pandemic transition phase) (*)
- Behaviour (*)
- Worry (*)
- Rumors (open-ended)
- Influenza risk perception: Probability and Severity

Randomization of answer options where suitable (*).

Variables include a combination of knowledge and behavioural questions that can only be answered by an individual based on the current situation along with other more complex constructs. For example, measuring self-reported knowledge may indicate gaps in accurate information being provided and will show misinformation that authorities can address in a timely manner. Asking people to what degree they are following suggested prevention interventions such as hand washing and social distancing shows how many people self-report contributing to the response in these ways.

Other constructs are more complex and require validated questions to accurately assess, such as risk perception, self-efficacy, trust, affect, fairness, prevention, resilience, worry and conspiracy thinking. These variables are measured using validated questions or adapted validated questions. See **Table 1** under Methodology: Survey Tool below for details.

Table 1.: Questionnaire – validation and value of variable and items included

Variable	Items relate to	Validation of psychological construct	Value in relation to study objectives
Socio-demography	Age, gender, education, medical background, chronic illness, rural/urban, district, household	Not a psychological construct	Allows stratifying findings per population groups
Risk group	COVID-19 infection (own, someone close)	Not a psychological construct	Allows stratifying findings per risk/non-risk group (also age above)
Self-assessed knowledge	Self-assessed knowledge to prevent spread	Psychological construct: self-assessment Items adapted from: Krawczyk, A., Stephenson, E., Perez, S., Lau, E., & Rosberger, Z. (2013). Deconstructing human papillomavirus (HPV) knowledge: objective and perceived knowledge in males' intentions to receive the HPV vaccine. *American Journal of Health Education*, *44*(1), 26-31.	Allows to compare self-assessed and real knowledge (see below) If perceived and objective knowledge differ, this might be the barrier to intended behaviour change
Knowledge symptoms, treatment	Knowledge: correct and incorrect symptoms (fever, cough, shortness of breath, sore throat, runny or stuffy nose, muscle or body aches, headache, fatigue (tiredness), diarrhea) Knowledge: treatment, vaccine	Not a psychological construct	Allows to detect possible misperceptions that need to be addressed
Knowledge incubation	Knowledge: incubation period (up to 3, 7, 14 days)	Not a psychological construct	Allows to detect possible misperceptions that need to be addressed
COVID-19 risk perception: Probability and Severity	Self-assessed probability and susceptibility to of contracting COVID-19 Self-assessed severity in case of contracting COVID-19	Psychological construct: risk perception. Validated items adapted from: Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: the example of vaccination. Health psychology, 26(2), 136.	Allows to stratify findings and identify possible patterns in behaviours/perceptions (see below) related to risk perceptions
Preparedness and Perceived self-efficacy	Self-assessed COVID-19 self-protection and avoidance ability	Psychological construct: preparedness Validated items adapted from: Bandura, A. (2006). Guide for constructing self-efficacy scales. *Self-*	Allows to stratify findings and identify possible patterns in behaviours/perceptions

Variable	Items relate to	Validation of psychological construct	Value in relation to study objectives
		efficacy beliefs of adolescents, *5*(1), 307-337. Psychological construct: perceived self-efficacy Validated items adapted from: Renner, B., & Schwarzer, R. (2005). The motivation to eat a healthy diet: How intenders and nonintenders differ in terms of risk perception, outcome expectancies, self-efficacy, and nutrition behavior. *Polish Psychological Bulletin*, *36*(1), 7-15.	(see below) related to self-efficacy
Prevention – own behaviours	Own behaviours: prevention measures (hand washing, avoid face, disinfectants, home when sick, cover coughing, balanced diet, physical distancing, email caution, diet restrictions, flu vaccine, face mask, avoiding crowds, antibiotics, homeopathic remedies, self-quarantine, not seeing family, friends)	Psychological construct: prevention behaviour Items adapted from: Steel Fisher GK et al (2012). Public response to the 2009 influenza A H1N1 pandemic: a polling study in five countries. *Lancet Infectious Diseases 2012; 12: 845–50*	Allows to compare knowledge and behaviour Allows to identify resiliency in upholding recommended behaviours which may need to be addressed
Knowledge and self-assessed adherence to prevention measures	Self-assessed adherence to prevention behaviours Knowledge: prevention measures (hand washing, avoid face, disinfectants, home when sick, cover coughing, balanced diet, physical distancing, email caution, diet restrictions, flu vaccine, face mask, avoiding crowds, antibiotics, homeopathic remedies, self-quarantine, other)	Not a psychological construct	Allows to compare self-assessed and real knowledge (see above) and detect possible misperceptions that need to be addressed
Affect	Affect related to COVID-19 (close, new, spreading, constant, fear-inducing, media hyped, worrying, helpless, stressful)	Psychological construct: affect Validated items adapted from: Bradley, M. M., & Lang, P. J. (1994). Measuring emotion: the self-assessment manikin and the semantic differential. Journal of behavior therapy and experimental psychiatry, 25(1), 49-59.	Allows to identify mental health implications of restriction – ultimately potentially as a warning sign that restrictions need to be changed
Trust in sources of information	Trust in information sources (public/private television, newspapers, family, friends, colleagues, health workers,	Psychological construct: trust Item ground in theory: Schweitzer, M. E., Hershey, J. C., & Bradlow, E. T. (2006). Promises and lies:	Allows to identify trusted information sources, to be used for planning communications

Variable	Items relate to	Validation of psychological construct	Value in relation to study objectives
	websites, online news pages, journals, social media, search engines public/private radio stations, other)	Restoring violated trust. Organizational behavior and human decision processes, 101(1), 1-19. Pearson, S. D., & Raeke, L. H. (2000). Patients' trust in physicians: many theories, few measures, and little data. Journal of general internal medicine, 15(7), 509-513.	
Use of sources of information	Use of information sources (public/private television, newspapers, family, friends, colleagues, health workers, websites, online news pages, journals, social media, search engines public/private radio stations, other) Information needs (symptoms, personal stories, scientific progress vaccine, scientific progress treatment, prevention behaviours, child's education)	Not a psychological construct	Allows to compare trust in and use of information sources and to identify widespread sources, to be used for planning communications
Frequency of Information	Frequency in information	Not a psychological construct	Allows to understand information needs, to be used for planning communications
Trust in institutions (perceptions)	Trust in ability of stakeholders to handle situation (own doctor, company physician, Employer Media Hospitals local/County health department Ministry of Health National Health Agency Medical professional associations Schools Universities Kindergartens Public transportation)	Psychological construct: trust Item grounded in theory: Schweitzer, M. E., Hershey, J. C., & Bradlow, E. T. (2006). Promises and lies: Restoring violated trust. *Organizational behavior and human decision processes*, 101(1), 1-19. Pearson, S. D., & Raeke, L. H. (2000). Patients' trust in physicians: many theories, few measures, and little data. *Journal of general internal medicine*, 15(7), 509-513.	Allows to understand trust, and trends related to this, to be used for planning communications – and for detecting possible shifts in trust (e.g. following certain events or new restrictions) which can inform/promote/avoid future events. Possible stratifying by risk perceptions, population groups, knowledge other…
Policies, interventions (perceptions)	Perceptions related to possible/real government policies (COVID-19 vaccine, personal freedom restrictions, internet access restrictions, face mask	Not a psychological construct	Allows to understand perceptions of policies, to inform policy planning, or to inform contingency plans before new policies. Possible stratifying by risk perceptions, population

Variable	Items relate to	Validation of psychological construct	Value in relation to study objectives
	obligations, testing, quarantine) Perceptions: discrimination behaviours		groups, knowledge other…
Conspiracies (perceptions)	Perceptions related to transparency, motivations, monitoring, secrets, hidden organizations.	Psychological constrict: conspiracy thinking Validated items taken from: Bruder M, Haffke P, Neave N, Nouripanah N, Imhoff R. Measuring individual differences in generic beliefs in conspiracy theories across cultures: conspiracy mentality questionnaire. Front Psychol. 2013;4:225. Published 2013 Apr 30. doi:10.3389/fpsyg.2013.00225	Allows to detect trends in possible conspiracy theories which may need to be addressed. Possible stratifying by risk perceptions, population groups, knowledge other…
Resilience (perceptions)	Perceptions related to coping with stress and recovering.	Psychological constrict: resilience Validated items taken from: Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: assessing the ability to bounce back. International journal of behavioral medicine, 15(3), 194-200.	Allows to identify mental health implications of restriction – ultimately potentially as a warning sign that restrictions need to be changed. Possible stratifying by risk perceptions, population groups, knowledge other…
Fairness (perceptions)	Perceptions related to fairness of COVID-19 decisions (fair, would convince others)	Psychological constrict: fairness Validated items taken from: Gamliel, E., & Peer, E. (2010). Attribute framing affects the perceived fairness of health care allocation principles. Judgment and Decision Making, 5(1), 11.	Allows to understand and possibly detect new trends in acceptance of restrictions which may inform new restrictions, lifting of restrictions, or the communication about these. Possible stratifying by risk perceptions, population groups, knowledge other…
Lifting restrictions (pandemic transition phase)	Perceptions related to lifting restrictions (in general, different restrictions depending on age, geography, obligatory face mask, obligatory testing) Own wish to maintain restrictions	Not a psychological construct	Allows to foresee reactions and perceptions concerning possible scenarios in the transition phase and to use these to inform decisions.
Behaviour	Reported own behaviour (hoarding, discrimination, exercise, diet, alcohol, postponing doctor visits, social distancing)	Not a psychological construct	Allows to identify adverse behaviours that may need to be addressed. Can be compared with data form doctors, supermarkets etc

Variable	Items relate to	Validation of psychological construct	Value in relation to study objectives
			to assess validity o0f finding.
Worry	Level of worry (related to losing a loved one, health system overload, small companies, economic recession, food supplies, unemployment, people who depend on them, defending decisions socially)	Psychological constrict: Domain-specific worry Validated items adapted from: McCarthy-Larzelere, M., Diefenbach, G. J., Williamson, D. A., Netemeyer, R. G., Bentz, B. G., & Manguno-Mire, G. M. (2001). Psychometric properties and factor structure of the Worry Domains Questionnaire. *Assessment*, 8(2), 177-191.	Allows to identify mental health implications of restriction – ultimately potentially as a warning sign that restrictions need to be changed. Possible stratifying by risk perceptions, population groups, knowledge other…
Rumors	Difficult-to-interpret information (open-ended question)	Not a psychological construct	Allows to detect misinformation and assess need to address these.
Influenza risk perception: Probability and Severity	Self-assessed probability and susceptibility to of contracting influenza Self-assessed severity in case of contracting influenza	Psychological construct: risk perception. Validated items adapted from: Brewer, N. T., Chapman, G. B., Gibbons, F. X., Gerrard, M., McCaul, K. D., & Weinstein, N. D. (2007). Meta-analysis of the relationship between risk perception and health behavior: the example of vaccination. Health psychology, 26(2), 136.	Allows to compare risk perceptions for COVID-19 and influenza Allows to measure differences in perceptions in risk domains: e.g. probability and severity usually differs between age groups, therefore they need different information for behaviour change

Data collection and analysis

Participants can be recruited via a trusted internal or external study sample provider as deemed feasible and appropriate by the national pandemic response authorities. The data collector may be:

- a trusted private market research agency
- an academic institution
- a government statistics agency
- other trusted data collection institution.

Users are recommended to share the current guidance and questionnaire with the data collector and discuss the process based on their available study tools and population panels. It needs to be specified in the agreement with data collectors that they need to follow data protection regulations as required by the state and regional authorities as well as GDPR, including as regards access to data, anonymity, protection of data, confidentiality and use of the data. The data must be collected in such a way where it will not be possible to identify individuals from the answers they have submitted.

It is recommended that a process of due diligence be conducted to evaluate the data practices of potential data collectors. Data collection and panel provider staff must have been provided with training on ethical considerations for the collection, use and storage of data (data security, data protection).

It is crucial to ensure the collected data is relevant, and not excessive in relation to the purpose for which it was obtained. The collected data should be exclusively used for the purpose of the current study and future related research. Users should ensure that the principles outlined in this document are met when working with data collectors.

Participants should take part in the survey voluntarily and can receive a remuneration, e.g. paid by the data collector. Remuneration should be agreed upon based on the usual procedures of the data collector and according to national standards. Each fielding period should be as short as possible as the situation evolves quickly, as do the peoples' perceptions. We suggest a maximum data collection period of maximum of 38-48 hours (e.g., 10am until 12pm the following day) with a maximum of two subsequent days.

After frequency of data collection (e.g. weekly) is decided on, each new data collection should take place with a new, independent sample.

The quota sample should match the current population in terms of age, gender and residency. Data collection can take place online or via phone (CATI).

Each country decides how they wish to analyse their data. One opportunity is offered with this tool: Based on a set of codes which have been pre-prepared for the questionnaire, the data (collected in an Excel file using specific labels) can be automatically and immediately displayed on a webpage which is protected by password. Each country decides which website is used for this (e.g. the ministry of health website, a website of a research institution or a website established just for this purpose). A design for the data display on this webpage has been created (in English). For a "dummy" presentation of how data is visualized, please see https://projekte.uni-erfurt.de/cosmo2020_web/cosmo-analyses.html. (**Username:** web. **Password:** pWmG68qptP6AdhXLF4gZ9nQG8pNHQUSE). This automatic display of the findings allows for fast access to the results for multiple stakeholders (as decided by the implementers). More in-depth analysis of the data, e.g. stratifying of variables can be added at any time. Commented code for data analysis and website are available in annexes 2 and 3.

Budget and timeline considerations

Costs associated with this study relate to data collection and human resources. Data collection may be conducted by government agencies as and where available. Some private sector market research firms have offered support for pro bono data collection, and this option can be explored on a country-by-country basis. Where third party, private data collection companies are hired, an estimated average cost per wave has been found to be $2,000-$4,000. The WHO Regional Office for Europe has some emergency funding to support data collection as well as staff in WHO country offices and at the Europe Regional Office to provide support.

Initiation of data collection can begin quite quickly (potentially within one week) depending on coordination between government and researchers and availability of data collection platform.

Institutional Review Board agreements, ethical standards met and safety monitoring

The study and handling of the data should follow all required regional and national data protection regulations. In general, data should be collected anonymously, with no collection of names, phone numbers, email addresses or other information which can identify participants or link participants to data. Only data from respondents aged 18+ will be included. If agencies collecting such data are hired, it

is expected to hire only those agencies that have procedures to ensure this. If such data is collected it has to be anonymized before the data is analyzed.

Also, participants should provide informed consent before starting the questionnaire. Text on this is included in the questionnaire in Annex 1. The research contains negligible risks as there is no foreseeable risk of harm or discomfort other than potential inconvenience during participation. The study does not include deception and participants will be debriefed at the end of the survey. The study also involves only non-identifiable data about human beings.

Ethical approval

Ethical approval should be sought at national level. Research is oriented on the ethical standards of American Association for Public Opinion Research (AAPOR) (https://www.aapor.org/Standards-Ethics/AAPOR-Code-ofEthics.aspx) and American Psychological Association (APA) (https://www.apa.org/ethics/code/).

Approval from the Ethical Review Committee of the WHO for the study and questionnaire may be sought on a country-by-country basis.

Sample

Small effects may matter greatly on a population level, so a large sample size is recommended to allow for meaningful results. To obtain a high level of congruence between the distribution of the demographics in the sample and the adult population (regarding age, gender and living area), a sample size of n = 1000 per wave is recommended.

Each data collection with n = 1000 participants is suggested as a quota sample, matching the general population in the country in terms of age, gender and state/district.

The recommendations aim to decrease bias by retaining key proportions that are identical to those of the country population. Moreover, the goal of using a sample size of 1000 is to make the sample as representative as possible of the country population. The sample size of 1000 is a recommended number for surveys of large size populations. Research shows that the precision of estimates of surveys only increases very slightly beyond a sample size of 1000 (19). Thus, costs of inviting more than 1000 participants may exceed the statistical benefits.

Tests

Analyses are suggested integrated in a R Notebook environment (for details, see Annex 2). All analyses are exploratory and may change based upon requirements of the situation. The data analysis script uses means of descriptive data presentation, regression analyses and correlation analyses.

Misinformation is collected as text fields and should be screened, summarized and offered to experts and those responsible for the crisis communication (e.g. to be debunked and inserted in FAQ lists).

Only completed data sets will be considered in the analysis. Missing values will be treated as missing values and not be imputed.

Scientific review and validation of tools

The protocol and questionnaire were originally prepared by Professor Betsch at the University of Erfurt, Germany, and subsequently reviewed by a group of experts (Fig. 3), representing leading global experts in behavioural insights research for health and in developing and validating survey tools similar to the current. In addition, following each rounds of data collection in Germany, two scientists (Prof. Robert Böhm, University of Copenhagen, Denmark, and Britta Renner, University of Konstanz, Germany) have reviewed the data and how it was presented. To the degree possible, already validated items from previous surveys conducted were included in the questionnaire (e.g. questions related to risk perception, self-efficacy, trust, affect, fairness, prevention, resilience, worry and conspiracy thinking) (Table 1). The questionnaire as a whole has been validated through the six rounds of data collection in Germany which led to adjustments of the questionnaire.

It is recommended that in each country, the protocol and questionnaire are translated by an expert translator familiar with terminology of COVID-19 and behavioural science and with interview skills. It should then be reviewed by at least two national peer reviewers and revised accordingly. Reviewers should endorse the final protocol and questionnaire upon revision. The questionnaire should be pre-tested with a sample of respondents (age groups, gender, urban/rural) with a focus on their easy understanding of the questions before broad use.

Limitations of the study

The urgency of the situation incurs some limitations to the study.

Using online panels limits the participation of certain important population groups, including the elderly (a risk group for COVID-19) and disadvantaged population groups such as migrants, refugees, young people below 18 years, homeless people and other vulnerable groups. Phone interviews as a supplement or instead of online panels can be used to mitigate this. Still, it may be assumed that some population groups will not take part in the survey, and so it cannot be claimed to represent their views, and the social benefit of the study may consequently be reduced. The findings of the survey need to be interpreted in this context. It may be considered to conduct supplementary more tailored and targeted surveys with specific population groups.

Since the findings related to the population at large may not apply to specific disadvantaged population groups, this affects the generalizability of the study findings. To overcome these limitations, health authorities are recommended to test recommended interventions informed by this survey with the broader population or specific population groups before rolling them out in a tailored fashion. This is possible for e.g. specific messages or communication initiatives which can be tested with the target audience.

Due to the rapid development of the tool, it has not yet been possible to validate that, if the findings from these (weekly) surveys are used to inform pandemic response measures, this will directly lead to behaviour change in the public.

In addition, the complexity of the pandemic and crisis and the public response is considerable, and an online survey can only serve to monitor a few key issues - not explore them in-depth. Importantly, this

survey can identify issues of concern that may need to be explored through other means, such as a supplementary qualitative telephone interview survey.

Another limitation of the study is that, while validated for other scales and well-grounded in robust behavioral research, the items have not been validated through a rigorous process for COVID-19 specifically. This is due only to the fact that we have never experienced this virus before and needs to be taken into account as a limitation in the interpretation of findings.

Self-reported behaviours are known to differ from actual behaviour, not least due to the social desirability effect, and so the findings related to behaviour should be interpreted with this reliability limitation in mind.

Finally, as each country to adapts the questionnaire, not all data collected with this tool can be compared across countries for future evaluation purposes. The hope is that each country will collect and analyse at least several variables in common that may provide useful insights for cross-country comparison, but the main purpose of this tool is to help countries right now to determine the best approaches for their immediate COVID-19 response.

Sharing the survey tool and guidance with other countries

If deemed appropriate, it is suggested that each user of the tool shares it via an open source research website to ensure methods and results can be shared with other countries.

4. Background: Review of relevant literature

Models of crisis and emergency risk communication (5) suggest that it is crucial to understand the risk perception of the population and the sources of information that they trust to enable effective communication and framing key messages. Messaging should be evidence-based and respond to misinformation and induce rational, adaptive and protective behaviour (6). However, little is known about the complex interplay of changing epidemiology, media attention, pandemic control measures, risk perception and public health behaviour (7). A study conducted during the influenza A(H1N1)pdm09 pandemic in 2009/2010 shows an “asynchronicity between media curves and epidemiological curves (…); media attention for influenza A H1N1 in Europe declined long before the epidemic reached its peak, and public risk perceptions and behaviours may have followed media logic, rather than epidemiological logic” (7). Thus, how people perceive the risk is not necessarily related to the actual risk. This perceived risk, nevertheless, influences protective behaviours (8). Yet, uncertainty about the situation and perceived exaggeration were associated with a reduced likeliness to implement the recommended protective behaviours during the 2009/10 pandemic (9). During the flu pandemic, a perceived inconsistency in recommendations was identified as a critical issue for non-compliance. Exaggeration of risks often happens on social media, where especially highly emotional and often false information are shared (10). While a serial cross-sectional study involving over 13,000 participants during the 2009/2010 pandemic (11) showed that the internet was significantly less used as a source of information than traditional media, this may well have changed over the last decade. For example, the number of monthly Twitter users multiplied by ten from 30 million in 2009 to 330 million in 2019 (12) and Twitter seems to be seen as an alert tool in times of a crisis and a gateway for information (13). Thus, knowledge acquired during the last pandemic is only of limited value to guide crisis responses in the current outbreak.

The coronavirus is new, there is no vaccine or known effective treatment, case fatality rates are still uncertain. Psychologically, this means high uncertainty regarding the likelihood of catching the disease, its potential severity and ability to take control over the process by preventive measure. These perceptions are thus likely to be updated based on changes in epidemiology, media reports, information and misinformation.

As media and communication measures can influence these variables (7)(11) and as these are relevant for preparedness and protective behaviour (5)(14),the University of Erfurt collaboration aims at monitoring these variables during the current COVID-19 pandemic and to feed them into the communication process during the crisis. An additional aim is to reliably assess changes and shifts of risk perceptions and to identify the drivers and situations that are related to these shifts. How closely is risk perception related to actual risk? Further, it is important to understand the dynamics of risk perceptions, fears, misinformation and protective behaviours, understand which of the protective measures are known and which information is lacking. Based on this information it is possible to react to misinformation or suddenly increasing risk perceptions and panics.

5. References

1. Uscher-Pines L, Omer SB, Barnett DJ, Burke TA, Balicer RD. Priority setting for pandemic influenza: an analysis of national preparedness plans. *PLoS Med* 2006; **3**: 436.
2. WHO Europe. (2017). Vaccination and trust—How concerns arise and the role of communication in mitigating crises.
3. Glik, D. C. (2007). Risk communication for public health emergencies. Annual Review of Public Health, 28, 33–54. https://doi.org/10.1146/annurev.publhealth.28.021406.144123
4. World Health Organization. (2017). Communicating risk in public health emergencies: A WHO guideline for emergency risk communication (ERC) policy and practice. World Health Organization.
5. Reynolds, B., & W. Seeger, M. (2005). Crisis and Emergency Risk Communication as an Integrative Model. Journal of Health Communication, 10(1), 43–55. https://doi.org/10.1080/10810730590904571
6. Rasmussen, S. A., & Goodman, R. A. (2018). The CDC Field Epidemiology Manual. Oxford University Press.
7. Reintjes R, Das E, Klemm C, Richardus JH, Keßler V, Ahmad A. "Pandemic Public Health Paradox": Time Series Analysis of the 2009/10 Influenza A / H1N1 Epidemiology, Media Attention, Risk Perception and Public Reactions in 5 European Countries. PLOS ONE 2016; 11: e0151258.
8. Van der Pligt J. Risk perception and self-protective behavior. European Psychologist 1996; 1: 34–43.
9. Rubin, G. J., Amlot, R., Page, L., & Wessely, S. (2009). Public perceptions, anxiety, and behaviour change in relation to the swine flu outbreak: Cross sectional telephone survey. BMJ, 339(jul02 3), b2651–b2651. https://doi.org/10.1136/bmj.b2651
10. Vosoughi, S., Roy, D., & Aral, S. (2018). The spread of true and false news online. Science, 359(6380), 1146– 1151. https://doi.org/10.1126/science.aap9559
11. Walter, D., Böhmer, M. M., Reiter, S., Krause, G., & Wichmann, O. (2012). Risk perception and informationseeking behaviour during the 2009/10 influenza A(H1N1)pdm09 pandemic in Germany. Eurosurveillance, 17(13), 20131.
12. Statista. (2019). Number of monthly active Twitter users worldwide from 1st quarter 2010 to 1st quarter 2019.

13. Eriksson, M., & Olsson, E.-K. (2016). Facebook and Twitter in Crisis Communication: A Comparative Study of
14. Carpenter, C. J. (2010). A meta-analysis of the effectiveness of health belief model variables in predicting behavior. Health Communication, 25(8), 661–669. https://doi.org/10.1080/10410236.2010.521906
15. Betsch C, Bach Habersaat K, Deshevoi S, et al. Sample study protocol for adapting and/or translating the 5C scale to assess the psychological antecedents of vaccination. BMJ Open 2020;0:e034869. doi:10.1136/bmjopen-2019-034869.
16. Betsch C, Wieler L, Habersaat K, and the COSMO consortium (submitted). Rapid and flexible monitoring tool for behavioural insights related to COVID-19 across countries.
17. Repository for frameworks: http://www.ncchpp.ca/708/repertoire_of_frameworks.ccnpps Including a framework on ethics during epidemics: https://neac.health.govt.nz/system/files/documents/publications/getting-through-together-jul07.pdf).
18. Nuffield Council of Bioethics: https://www.nuffieldbioethics.org/publications/research-in-global-health-emergencies
19. Taherdoost, H. (2017). Determining sample size; how to calculate survey sample size. *International Journal of Economics and Management Systems*, *2*.

Other relevant literature

- Crisis Communication Professionals and Citizens. Journal of Contingencies and Crisis Management, 24(4), 198–208.
- Renn, O. (2008). Risk communication: Insights and requirements for designing successful communication programs on health and environmental hazards. In R. L. Heath & H. D. O'Hair (Eds.), Handbook of risk and crisis communication (pp. 80–98). Routledge.
- Sandman, P. M. (2007). Crisis Communication Best Practices: Some Quibbles and Additions. Journal of Applied Communication Research, 34(3), 257–262. https://doi.org/10.1080/00909880600771619
- Schmid, P., & Betsch, C. (2019). Effective strategies for rebutting science denialism in public discussions. Nat Hum Behav, 3(9), 931–9.
- https://www.statista.com/statistics/282087/number-of-monthly-active-twitter-users/
- Statistisches Bundesamt. (2020). Bevölkerung: Bundesländer, Stichtag. https://wwwgenesis.destatis.de/genesis/online/data?operation=abruftabelleBearbeiten&levelindex=1&levelid=1582808295648&auswahloperation=abruftabelleAuspraegungAuswaehlen&auswahlverzeichnis=ordnungsst ruktur&auswahlziel=werteabruf&code=12411-0010&auswahltext=&werteabruf=starten
- World Health Organization. (2020). World experts and funders set priorities for COVID-19 research. World Health Organization. https://www.who.int/news-room/detail/12-02-2020-world-experts-and-funders-setpriorities-for-covid-19-research
- Gamliel, E., & Peer, E. (2010). Attribute framing affects the perceived fairness of health care allocation principles. *Judgment and Decision Making*, *5*(1), 11.
- Wiwad, D., Mercier, B., Maraun, M. D., Robinson, A. R., Piff, P. K., Aknin, L. B., & Shariff, A. F. (2019). The support for economic inequality scale: Development and adjudication. *PloS one*, *14*(6)

Annex 1: Questionnaire

Please note:

The following is the recommended standard approach. The most current version of the standard approach can be shared by WHO as an adaptable word version. Please contact Katrine Habersaat (habersaatk@who.int) or Martha Scherzer (scherzerm@who.int).

The situation evolves rapidly and unevenly across the world, and so tailoring of the questionnaire to specific contexts is critical. Each country can select which variables they wish to focus on and can adapt items to their specific needs. Words highlighted in yellow indicate that context adaptation needs to be ensured.

Please see Annex 2 regarding coding of the questionnaire. WHO Regional Office for Europe can also provide guidance on this.

Page 1 Introduction	Dear Participant, Thank you for taking part in this study to help improve actions taken in response to the novel coronavirus pandemic (Covid-19) and to inform the response to similar future outbreaks. This study will involve answering a XX-minute survey which will be asking you questions relating to the coronavirus. Please do not start until you will have enough time to complete it in one go. Please close other programmes (e.g. chat or e-mail) to avoid distractions. This study is conducted by [insert name of controller] and the data is collected by [insert name of the data collection agency]. By taking part, you are agreeing that you have read and understood the information about the study below. Please ensure you have read and understood this information before continuing. **What is this project about, and do I have to take part?** This study aims to inform governmental outbreak response measures, including policies, interventions and communications. The information collected through this survey is important to support the implementation of specific programmatic interventions and policies in addition to the messaging necessary to encourage uptake of those measures.

	Participation is open to people at the age of 18 or over, living in [insert name of country] and is entirely voluntary. You do not have to be in isolation to take part. **What are the benefits and risks of taking part?** You may benefit from taking part in the survey by being motivated to look up information about the coronavirus pandemic. We will provide you with good resources at the end of the study. There are no foreseeable risks for you when taking part in the survey other than time spent on the survey and potential discomfort. Should you feel uncomfortable and want to leave the study you are free to do so without any consequences. **What will you ask and what will happen to the information I give you?** You will be asked questions about yourself, your knowledge of the coronavirus, the actions you have taken to protect yourself from the virus, your trust in various stakeholders, and your own fears and worries relating to the coronavirus pandemic. Some of these questions are considered sensitive data, such as questions relating to your trust in your government. However, you will not be asked to provide any personal data. Your anonymous data will be collected by [insert name of the data collection agency] and analysed by [insert name of controller]. Your data will be shared, but only with relevant researchers and government agencies. However, your data will be completely anonymous, and it will not be possible to identify you individually from your answers. This study has received approval from the WHO Research Ethics Review Committee and [insert name of relevant national or university ethics review committee]. **How long will my data be stored for?** In order to help inform future pandemic and epidemic preparedness, the data you have provided will be helpful even beyond the current coronavirus pandemic. Your anonymous data will therefore be stored securely for up to 10 years by [insert name of controller] after the end of the research for this study. At this point the data will be reviewed, and if they are still deemed to be of public interest, they may be retained for longer. If not, your data will be permanently deleted. **Local Data Protection Privacy Notice** Notice: The controller for this project will be [insert name of controller]. The data will be collected by [insert name of the data collection agency]. This 'local' privacy notice sets out the information that applies to this particular study. Further information on how [insert name of controller] uses participant information can be found in the 'general' privacy notice: [provide relevant link to general data protection information of the controller]. The information that is required to be provided to participants under data protection legislation (GDPR [and/or other national data protection laws]) is provided across both the 'local' and 'general' privacy notices.

	The lawful bases used in this survey are that it is undertaken as a task in the public interest and necessary for research and public health purposes, in accordance with the General Data Protection Regulation and national laws. **Concerns** If you are concerned about this study, or how your data is being processed, or if you would like to contact us about your rights, please get in touch with [insert name of controller] in the first instance at [insert contact email address]. **Consent** I understand that: • My participation is completely voluntary. • All my answers will be used for scientific research to improve actions taken in response to the coronavirus pandemic and to inform the response to similar future outbreaks. • My data will be stored securely, however, no personal data will be stored, and my answer will be completely anonymous. • My data gathered in this study will be shared with relevant researchers and government agencies. • Because I am submitting anonymous data, it will not be possible to withdraw my answers after they have been submitted. Please note that you can stop the survey at any time. This will not entail any penalty, and it will not affect the services (health care services or others) that you receive. By ticking the box, you are agreeing that you are at least 18 years old, that you have read the information about the study, and that you voluntarily agree to take part in it. [*] I agree to participate in this study.
Page 2 Variable: socio-demography	**How old are you?** I am ____ years old. **What is your gender?** [*] Male [*] Female

	[*] Other
[Screen out: <18]	**How many years of education have you completed?** Adapt to local context [*] 0-9 years [*] 10-12 years (secondary school completed) [*] more than 12 years **Are you a medical professional?** [*] Nurse [*] Medical doctor [*] Pharmacist [*] Other **Do you have a chronic illness?** [*] Yes [*] No [*] Don't know **How many** inhabitants **live in the village or town in which you live?** Adapt to local context [*] ≤ 5,000 inhabitants [*] 5,001 - 20,000 inhabitants [*] 20,001 - 100,000 inhabitants [*] 100,001 - 500,000 inhabitants [*] > 500,000 inhabitants

	[*] Do not know **Where do you live?** [*] Rural area [*] Urban area **In which district do you live?** Adapt to local context. [Dropdown list with all regions of country] **Do you have children living at home with you?** [*] Yes [*] No **How many people live in your household, including yourself?** [*] I live alone [*] I live with 1 or more persons
Page 3 Variable: Risk group [Single choice] [Single choice]	**Are you, or have you been, infected with the novel coronavirus?** [*] Yes, tested and the result was positive [*] Yes, suspected but not confirmed by a test [*] No, tested and the result was negative [*] No [*] Don't know **Do you know people in your immediate social environment who are or have been infected with the novel coronavirus?** [*] Yes, confirmed [*] Yes, suspected but not confirmed by a test

[Multiple choice for yes]	[*] No, tested and the result was negative [*] No [*] Don't know Please click CONTINUE to proceed
Page 4 Variable: Self-assessed knowledge	**How would you rate your knowledge level on how to prevent spread of the novel coronavirus?** Very poor knowledge [*] [*] [*] [*] [*] [*] [*] Very good knowledge Please click CONTINUE to proceed
Page 5 Variable: Knowledge symptoms, treatment [Random order of symptom items]	**Which of the following can be symptoms of the novel coronavirus?** Please select as many as apply **Fever** [*] Related to the newly emerged coronavirus [*] Not related to the newly emerged coronavirus [*] Don't know (same response categories for each of the symptoms listed below) **Cough** [Answer scheme: see "Fever"] **Shortness of breath** [Answer scheme: see "Fever"] **Sore throat** [Answer scheme: see "Fever"] **Runny or stuffy nose** [Answer scheme: see "Fever"] **Muscle or body aches** [Answer scheme: see "Fever"] **Headaches** [Answer scheme: see "Fever"] **Fatigue (tiredness)** [Answer scheme: see "Fever"] **Diarrhea** [Answer scheme: see "Fever"] **Loss of taste and smell** [Answer scheme: see "Fever"]

[Random order of the first two answer options]	**Which answer is correct?** [*] There is a drug to treat the novel coronavirus. [*] There is a vaccine for the novel coronavirus. [*] There is both a drug for the treatment and a vaccine for the novel coronavirus. [*] There is currently no drug treatment or vaccine for the novel coronavirus. [*] Don't know Please click CONTINUE to proceed
Page 6 Variable: Knowledge incubation	**What is the** maximum **incubation period (i.e., the time from viral infection to developing symptoms of illness) of the novel coronavirus?** [*] Up to 3 days [*] Up to 7 days [*] Up to 14 days [*] Don't know Please click CONTINUE to proceed
Page 7 Variable: Probability and Severity	**What do you consider to be your own probability of getting infected with the novel coronavirus?** Extremely unlikely [*] [*] [*] [*] [*] [*] [*] Extremely likely **How susceptible do you consider yourself to an infection with the novel coronavirus?** Not at all susceptible [*] [*] [*] [*] [*] [*] [*] Very susceptible **How severe would contracting the novel coronavirus be for you (how seriously ill do you think you will be)?** Not severe [*] [*] [*] [*] [*] [*] [*] Very severe Please click CONTINUE to proceed
Page 8 Variable: Preparedness and	**Next, we would like to know about you own practices related to the novel coronavirus.** **I know how to protect myself from coronavirus** Not at all [*] [*] [*] [*] [*] [*] [*] Very much so

Perceived self-efficacy	**For me avoiding an infection with the novel coronavirus in the current situation is…** Extremely difficult [*] [*] [*] [*] [*] [*] [*] Extremely easy Please click CONTINUE to proceed
Page 9 Variable: Prevention – own behaviours [Random order of items; except "Another preventive measure"]	**Which of the following measures have you taken to prevent infection from the novel coronavirus?** Please indicate for all measures below whether you have already taken them. Adapt to national recommendations: Specify to the degree possible, depending on national recommendations . **Hand washing for at least 20 seconds** [*] Yes [*] No [*] Does not apply **Avoiding touching your eyes, nose, and mouth with unwashed hands** [Answer scheme, see above] **Use of disinfectants to clean hands when soap and water was not available for washing hands** [Answer scheme, see above] **Staying home when you were sick or when you had a cold** [Answer scheme, see above] **Herbal supplements** [Answer scheme, see above] **Covering your mouth and nose when you cough or sneeze** [Answer scheme, see above] **Using caution when opening letters** [Answer scheme, see above] **Getting the flu vaccine** [Answer scheme, see above] **Wearing a face mask** [Answer scheme, see above] **Using antibiotics** [Answer scheme, see above] **Using homeopathic remedies** [Answer scheme, see above] **Physical distancing (keeping minimum 2 metres between you and other persons outside your household)** [Answer scheme, see above] **Self-isolation** [Answer scheme, see above]

	Disinfecting surfaces [Answer scheme: see “Hand washing”] **Disinfecting the mobile phone** [Answer scheme: see “Hand washing”] **Eating garlic, ginger, lemon** [Answer scheme: see “Hand washing”] **Another preventive measure, please specify**… **Not seeing my family living outside my own home is** Impossible [*] [*] [*] [*] [*] [*] [*] Very easy to do **Not seeing my friends is** Impossible [*] [*] [*] [*] [*] [*] [*] Very easy to do Please click CONTINUE to proceed
Page 10 Variable: Knowledge and self-assessed adherence to preventive measures [Random order of items; except “Another preventive measure”]	**I follow the recommendations from authorities in my country to prevent spread of novel coronavirus.** Not at all [*] [*] [*] [*] [*] [*] [*] [*] [*] Very much so **Which of the following are effective measures to prevent the spread and infection of the novel coronavirus?** Please evaluate all preventive measures listed below. **Hand washing for at least 20 seconds** [*] Yes [*] No [*] Don’t know **Avoiding touching your eyes, nose, and mouth with unwashed hands** [Answer scheme: see “Hand washing”] **Use of disinfectants to clean hands when soap and water is not available for washing hands** [Answer scheme: see “Hand washing”] **Staying home when you are sick or when you have a cold** [Answer scheme: see “Hand washing”] Adapt below list to local context/above list **Herbal supplements** [Answer scheme: see “Hand washing”]

	Covering your mouth when you cough [Answer scheme: see “Hand washing”] **Using caution when opening letters** [Answer scheme: see “Hand washing”] **Getting the flu vaccine** [Answer scheme: see “Hand washing”] **Wearing a face mask** [Answer scheme: see “Hand washing”] **Using antibiotics** [Answer scheme: see “Hand washing”] **Using homeopathic remedies** [Answer scheme: see “Hand washing”] **Physical distancing (keeping minimum 2 metres between you and other persons outside your household)** [Answer scheme: see “Hand washing”] **Self-isolation** [Answer scheme: see “Hand washing”] **Disinfecting surfaces** [Answer scheme: see “Hand washing”] **Disinfecting the mobile phone** [Answer scheme: see “Hand washing”] **Eating garlic, ginger, lemon** [Answer scheme: see “Hand washing”] **Another preventive measure, please specify…** [*] Yes [*] No [*] Don’t know Please click CONTINUE to proceed
Page 11 Variable: Affect	**Please choose one option per row below. The novel coronavirus to me feels ...** close to me [*] [*] [*] [*] [*] [*] [*] far away from me New [*] [*] [*] [*] [*] [*] [*] Old Spreading slowly [*] [*] [*] [*] [*] [*] [*] Spreading fast Something I think about all the time [*] [*] [*] [*] [*] [*] [*] Something I almost never think about Fear-inducing [*] [*] [*] [*] [*] [*] [*] Not fear-inducing

[Random order of items]	Media hyped [*] [*] [*] [*] [*] [*] [*] Not media hyped Worrying [*] [*] [*] [*] [*] [*] [*] Not worrying Something that makes me feel helpless [*] [*] [*] [*] [*] [*] [*] Something I am able to combat with my own action Stressful [*] [*] [*] [*] [*] [*] [*] Not stressful Something that is making me depressed [*] [*] [*] [*] [*] [*] [*] Something that does not affect my mood Please click CONTINUE to proceed
Page 12 Variable: Trust in sources of information [Random order of items, except other] [employer and health insurance are no compulsory items]	Adapt to local context: **How much do you trust the following sources of information in their reporting about the novel coronavirus?** **Public television stations** Very little trust [*] [*] [*] [*] [*] [*] [*] A great deal of trust **Daily or weekly newspapers** [Answer scheme, see above] **Conversations with family and friends** [Answer scheme, see above] **Conversations with colleagues** [Answer scheme, see above] **Consultation with health workers** [Answer scheme, see above] **Private television stations** [Answer scheme, see above] **Websites or online news pages** (e.g. [adapt to local context]) [Answer scheme, see above] **Social media (e.g. Facebook, Twitter, YouTube, WhatsApp)** [Answer scheme, see above] **Private radio stations** [Answer scheme, see above] **Public radio stations** [Answer scheme, see above] **Official, government press releases** [Answer scheme, see above] **Medical institutions press releases** [Answer scheme, see above] **Opinion polls** [Answer scheme, see above] **Celebrities and social media influencers** [Answer scheme, see above]

	Other sources, namely: _____ Please click CONTINUE to proceed
Page 13 Variable: Use of sources of information [Random order of items; except other] [employer, health insurance, and other are no compulsory items]	Adapt to local context: **How often do you use the following sources of information to stay informed about the novel coronavirus?** **Public television stations** Never [*] [*] [*] [*] [*] [*] [*] Very often **Daily or weekly newspapers** [Answer scheme, see above] **Conversations with family and friends** [Answer scheme, see above] **Conversations with colleagues** [Answer scheme, see above] **Private television stations** [Answer scheme, see above] **Websites or online news pages (e.g. web.de, t-online.de)** [Answer scheme, see above] **Social media (e.g. Facebook, Twitter, YouTube, WhatsApp)** [Answer scheme, see above] **Private radio stations** [Answer scheme, see above] **Public radio stations** [Answer scheme, see above] **Official, government press releases** [Answer scheme, see above] **Medical institutions press releases** [Answer scheme, see above] **Opinion polls** [Answer scheme, see above] **Celebrities and social media influencers** [Answer scheme, see above] **Other sources, namely:** _____ **The type of information I need the most, relates to…** **Symptoms of novel coronavirus** [*] Yes [*] No

	How I can protect myself and my family against the novel coronavirus [*] Yes [*] No **Personal stories from other people on how they cope with the pandemic situation** [*] Yes [*] No **Scientific progress in development of a vaccine or treatment against novel coronavirus** [*] Yes [*] No **How I can take care of a person who belongs to a risk group** [*] Yes [*] No **How I can best take care of my children's school education** [*] Yes [*] No **How the novel coronavirus is different from other diseases such as flu** [*] Yes [*] No **The pandemic evolution in the world** [*] Yes [*] No **The pandemic evolution in [country]** [*] Yes [*] No **Information about authorities' decisions** [*] Yes [*] No **How I will be impacted economically by the pandemic** [*] Yes [*] No **How to maintain my mental health during the isolation** [*] Yes [*] No **How to maintain my social contact despite the physical distancing** [*] Yes [*] No **Other, please specify…** Please click CONTINUE to proceed
Page 14 Variable: Frequency of Information	**How often do you inform yourself about the novel coronavirus?** Never [*] [*] [*] [*] [*] [*] [*] Several times a day Please click CONTINUE to proceed
Page 15	**How much confidence do you have in the below individuals and organizations that they can handle the novel coronavirus well?**

Variable: Trust in institutions (perceptions) [Random order of items]	Adapt to local context **Your own family doctor** Very low confidence [*] [*] [*] [*] [*] [*] [*] Very high confidence / Not applicable [*] **Other specialist physicians** Very low confidence [*] [*] [*] [*] [*] [*] [*] Very high confidence / Not applicable [*] **Your company physician (if applicable)** [Answer scheme, see above] **Your Employer (if applicable)** [Answer scheme, see above] **Media** [Answer scheme, see above] **Other opinion leaders** [Answer scheme, see above] **Hospitals** [Answer scheme, see above] **Ministry of Health** [Answer scheme, see above] **Local Public Health Authority** [Answer scheme, see above] **Medical professional associations (e.g.** [adapt to local context]**)** [Answer scheme, see above] **Schools** [Answer scheme, see above] **Universities** [Answer scheme, see above] **Kindergartens** [Answer scheme, see above] **Public transportation companies** [Answer scheme, see above] **Government** [Answer scheme, see above] **Police** [Answer scheme, see above] **Army** [Answer scheme, see above] **Church** [Answer scheme, see above] **The president** [Answer scheme, see above] **Other, please specify…** Please click CONTINUE to proceed

Page 16 Variable: Policies, interventions (perceptions) [Random order of items]	**Please now give your opinion on the following statements.** Adapt to local context **If a vaccine becomes available and is recommended for me, I would get it.** Strongly disagree [*] [*] [*] [*] [*] [*] [*] Strongly agree **In the event of an outbreak it's appropriate to avoid certain people on the basis of their country of origin.** [See answer scheme above.] **The government should be allowed to force people into self-isolation if they are infected** [See answer scheme above.] **The government should be allowed to force people into self-isolation if they have been in contact with a person who was infected** [See answer scheme above.] **The government should restrict access to the Internet and social media to combat the spread of misinformation about the novel coronavirus.** [See answer scheme above.] **From now on, anyone moving in public areas should be required to wear a face mask** [See answer scheme above.] **More tests for coronavirus infection should be carried out in the population** [See answer scheme above.] **I think that the restrictions currently being implemented are greatly exaggerated.** [See answer scheme above.] **It should only be allowed to leave your house for professional, health or urgent reasons.** [See answer scheme above.] Please click CONTINUE to proceed
Page 17 Variable: Conspiracies (perceptions)	**Please consider the decisions that are made in your country to reduce spread of the novel coronavirus:** **I think that….** **…many very important things happen in the world, which the public is never informed about** certainly not true [*] [*] [*] [*] [*] [*] [*]certainly true **… politicians usually do not tell us the true motives for their decisions**[See answer scheme above.] **… government agencies closely monitor all citizens**[See answer scheme above.] **… events which superficially seem to lack a connection are often the result of secret activities**[See answer scheme above.] **… there are secret organizations that greatly influence political decisions**[See answer scheme above.]

	Please click CONTINUE to proceed
Page 18 Variable: resilience (perceptions) Resilience	**Please consider your experience during the novel coronavirus pandemic:** **I have a hard time making it through stressful events** Strongly disagree [*] [*] [*] [*] [*] [*] [*] Strongly agree **It does not take me long to recover from a stressful event** [See answer scheme above.] **It is hard for me to snap back when something bad happens** [See answer scheme above.] Please click CONTINUE to proceed
Page 19 Variable: Fairness (perceptions)	**Please consider the decisions that are made in your country to reduce spread of the novel coronavirus:** **I think the decisions are fair** Strongly disagree [*] [*] [*] [*] [*] [*] [*] Strongly agree **I would convince others that the decisions are right** Strongly disagree [*] [*] [*] [*] [*] [*] [*] Strongly agree Please click CONTINUE to proceed
Page 20 Lifting restrictions (pandemic transition phase)	Adjust the below to potential scenarios in the country **There is currently a discussion about how some restrictions can be changed after the first peak of the novel coronavirus. Please give your opinion on the following statements.** **After the peak of the pandemic, only people over the age of 70 should stay at home** Strongly disagree [*] [*] [*] [*] [*] [*] [*] Strongly agree **After the peak of the pandemic, the restrictions should be upheld in towns and cities, but not rural areas** [See answer scheme above.] **After the peak of the pandemic, the smaller children should be able to return to school, but not the older ones who can take care of themselves at home** [See answer scheme above.] **After the peak of the pandemic, restrictions should be lifted in the counties where less people are infected, but not in counties where more people are infected** [See answer scheme above.] **Current restrictions should not be lifted, even beyond the peak of the pandemic** [See answer scheme above.]

	After the peak of the pandemic, everyone should be obligated to wear a mask in public. [See answer scheme above.] **After the peak of the pandemic, obligatory mass testing is an acceptable way to identify infected persons** [See answer scheme above.] **After the peak of the pandemic,] I will continue to live up to restrictions, even if they are no longer formal recommendations from my government** [See answer scheme above.] Please click CONTINUE to proceed
Page 21 Variable: Behaviour [Integrate in randomized order of the policy items] [Random order of items]	**Have** you **done** the following during the pandemic**…?** Adapt to local context **Bought food supplies on a large scale** [*] I already did that [*] I plan to do that [*] I don't plan to do that **Bought other everyday things on a large scale** [See answer scheme above.] **Avoided people who come from countries where coronavirus cases have occurred, such as China or Italy** **Exercised less than I usually do** [See answer scheme above.] **Drank more alcohol than I usually do** [See answer scheme above.] **Ate more unhealthy food than I usually do** [See answer scheme above.] **Avoided going to the doctor with issues that could be postponed, e.g. vaccination or a check-up** [See answer scheme above.] **Asked family members or friends not to visit me** [See answer scheme above.] **Decided that my child could not meet with a friend** [See answer scheme above.] **Bought drugs that I heard that are good for treating COVID-19** [See answer scheme above.] **Bought personal protection equipment (masks, gloves)** [See answer scheme above.] Please click CONTINUE to proceed

Page 22 Variable: Worry [Random order of items; except other]	**Crises often involve fears and worries. Please let us know:** **At the moment, how much do you worry about:** adapt to local context **losing someone I love** Don't worry at all [*] [*] [*] [*] [*] [*] [*] worry a lot **health system being overloaded** [See answer scheme above.] **my own mental health** [See answer scheme above.] **my own physical health** [See answer scheme above.] **my loved ones' health** [See answer scheme above.] **restricted liberty of movement** [See answer scheme above.] **loosing vacation opportunities** [See answer scheme above.] **small companies running out of business** [See answer scheme above.] **economic recession in my country** [See answer scheme above.] **restricted access to food supplies** [See answer scheme above.] **becoming unemployed** [See answer scheme above.] **not being able to pay my bills** [See answer scheme above.] **not be able to visit people who depend on me** [See answer scheme above.] **having to defend a decision not to participate in a social event which my family or friends expect me to attend** [See answer scheme above.] **other: ____** Please click CONTINUE to proceed
Page 23 Variable: Rumors	**Have you encountered information on the novel coronavirus where you found it hard to decide whether it was right or wrong? For example, information about ways to prevent the disease or to recover.** **Please write this information in the boxes below. You can provide up to three types of information. Please use a separate box for each type of information.**

	Please note that on the next page you will receive links to trustworthy information about the novel coronavirus. **If you cannot or do not want to answer this question, scroll down and click No.** **Information:** _____ **Information:** _____ **Information:** _____ **[*] No, I have not heard or read any information that I am unsure of.** Please click CONTINUE to proceed
Page 24 Variable: Influenza risk perception: Probability and Severity	**What is your probability of getting infected with the seasonal flu (influenza)?** Extremely unlikely [*] [*] [*] [*] [*] [*] [*] Extremely likely **How severe would contracting the seasonal flu (influenza) be for you?** Not severe [*] [*] [*] [*] [*] [*] [*] Very severe **How susceptible do you consider yourself to an infection with the** seasonal flu (influenza)**?** Not at all susceptible [*] [*] [*] [*] [*] [*] [*] Very susceptible Please click CONTINUE to proceed
Page 25 Debriefing	Debriefing Thank you very much! Your participation provides valuable insights for all of us to react appropriately in the current novel coronavirus situation and to reach all citizens with useful information in a timely manner. For information about the novel coronavirus**,** please visit the following websites: www.ms.ro, www.insp.gov.ro, www.mai.gov.ro, www.stirioficiale.ro Adapted to national setting: add one or more trusted information sources

	If you have any questions, please contact Adapted to national setting: add contact person in implementing country. If you have changed your opinion and would like to withdraw your consent to use your data, please click on “Withdraw my consent”. [*] Withdraw my consent Please click CONTINUE to finish the survey

Annex 2: Data analysis and presentation of results

Data can be analysed with any data analysis software.

In order to facilitate the process of analysing and presenting the data, we offer a RMarkdown notebook (based on the free software R). These notebooks blend analysis code with result output like plots and regression tables as well as explanatory text. The University of Erfurt collaboration group implemented a first template that is offered as a blueprint for other countries.

Please note:

As the questionnaire is adapted to country specific features (e.g. different states and authorities) the notebook has to be tailored as well. Consequently, before collecting the first data, a custom notebook needs to be created for each subgroup.

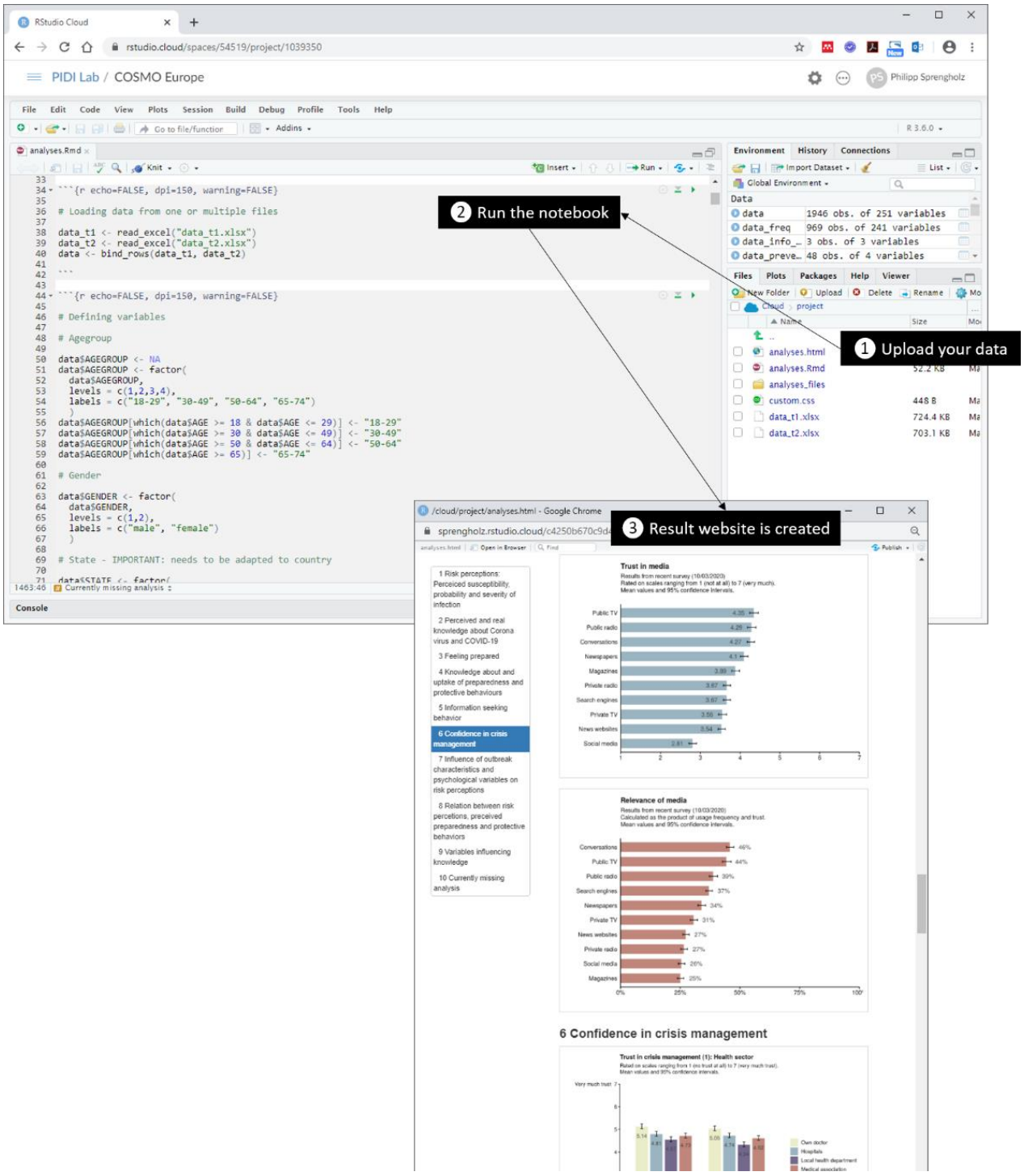
Each notebook is hosted on RStudio cloud, a free to use online platform where questionnaire data can be uploaded. With a single click, notebooks can be executed then, i.e. data analyses are run and a website is generated visualizing the main results (see Figure 3).

The code is offered as a *.zip file at https://hdl.handle.net/20.500.12034/2392 and can be uploaded to a RStudio cloud.

Please check for updates in the repository (https://hdl.handle.net/20.500.12034/2392) where new examples of code will be offered. We suggest that countries also share their code as part of survey documents using open source research platforms, allowing other countries to use the code on their data.

It is important that the data set uses the variable labels and codes as provided in Annex 1 to allow the script to run without errors.

Figure 3: Data analysis workflow using RMarkdown notebooks



The WHO Regional Office for Europe

The World Health Organization (WHO) is a specialized agency of the United Nations created in 1948 with the primary responsibility for international health matters and public health. The WHO Regional Office for Europe is one of six regional offices throughout the world, each with its own programme geared to the particular health conditions of the countries it serves.

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