WHO R&D Blueprint

COVID-19

WHO COVID-19 Social Science in Outbreak Response

Perceptions of Health workers regarding local infection prevention and control procedures for COVID-19: Research protocol

5 May 2021

Version: 1.1

Contact: Bayugo@who.int
WHO reference number

© World Health Organization 2020. All rights reserved.

This is a draft. The content of this document is not final, and the text may be subject to revisions before publication. The document may not be reviewed, abstracted, quoted, reproduced, transmitted, distributed, translated or adapted, in part or in whole, in any form or by any means without the permission of the World Health Organization.

The mention of specific companies or of certain manufacturers’ products does not imply that they are endorsed or recommended by WHO in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.
Acknowledgments

This protocol was developed for the World Health Organisation COVID-19 Research Roadmap as a joint initiative between the social science and infection prevention and control working groups.

This protocol was developed by Nina Gobat (University of Oxford, GOARN-Research), Denise van Hout (UMC Utrecht), Emily Chan (University of Hong Kong), Anna Levin (University of Sao Paulo), Maria Clara Padoveze Fonseca Barbosa (WHO), Alice Simniceanu (WHO), Alessandro Cassini (WHO), Benedetta Allegranzi (WHO), Dayo Spencer-Walters (WHO), Victoria Willet (WHO)

Expert input was provided by: Lauren Clack (University Hospital Zurich), Barry Cookson (Imperial College London), Mitchell Schwaber, John Amuasi (Kumanis Centre), Srin Murthy (University of British Columbia), Lisa Puchalski Ritchie (Unity Health Toronto), Sarah Tonkin-Crine (University of Oxford), Sibyl Anthierens (University of Antwerp), Jeni Stolow (Tulane University, GOARN-Research), Gillian McKay (London School of Hygiene and Tropical Medicine, GOARN-Research), Paul Hutchinson (Tulane University), Bhagteshwar Singh (Royal Liverpool University Hospital), Caitlin Pilbeam (University of Oxford), Phuong Pham (Harvard T.H. Chan School of Public Health), Catherine Kane (WHO), Aiysha Malik (WHO), Sobia Khan (Center for Implementation Science), Lauren Tessier (Center for Implementation Science)

Queries should be directed to Nina Gobat (nina.gobat@phc.ox.ac.uk) or Yolanda V. Bayugo (bayugo@who.int).
Summary

<table>
<thead>
<tr>
<th>Perceptions of health workers regarding local infection prevention and control measures for COVID-19</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Study population</strong></td>
</tr>
<tr>
<td>A) Health professionals providing direct clinical care to patients in community, hospital, and/ or ambulance emergency response settings. Including, but not limited to medical doctors, nurses, nursing assistants, allied health professionals, students and other roles with direct patient care.</td>
</tr>
<tr>
<td>B) Staff involved in running clinical services in community, hospital, and/ or ambulance emergency response settings. Including, but not limited to senior managers, receptionists, other administrative roles, cleaners, porters, janitors and other non-clinical roles.</td>
</tr>
<tr>
<td><strong>Study design</strong></td>
</tr>
<tr>
<td>Cross-sectional survey</td>
</tr>
<tr>
<td><strong>Implementation</strong></td>
</tr>
<tr>
<td>This protocol sets out an approach to guide rapid assessment of health worker views of local infection prevention and control (IPC) procedures for COVID-19. It is designed to be rapidly adapted at local, regional or national levels using a convenience sampling frame. Data will be collected using a standardized questionnaire administered online via KoBoToolBox. All regulatory and administrative approvals need to be obtained by the user, and data should be processed in line with national data protection regulations. We recommend that the data collection tool be refined and adapted where needed to ensure contextual appropriateness.</td>
</tr>
<tr>
<td><strong>Potential outputs and analysis</strong></td>
</tr>
<tr>
<td>The standard questionnaire captures demographics, epidemiological information, HW perception of individual and organizational preparedness to implement IPC, and HWs’ current mental wellbeing. Additional modules to capture stigma, vaccine hesitancy, prolonged PPE use, return to work and SARS-COV-2 variants are available on KoBoToolBox under the Harvard Humanitarian Initiative (HHI) question library.</td>
</tr>
</tbody>
</table>
Table of Contents

Acknowledgments ........................................................................................................................................ 3  
Summary .................................................................................................................................................. 4  
Abbreviations ......................................................................................................................................... 6  
1. Background .......................................................................................................................................... 7  
   1.1 Introduction ...................................................................................................................................... 7  
   1.2 Objectives ....................................................................................................................................... 8  
2. Methods ............................................................................................................................................... 9  
   2.1 Design and duration ......................................................................................................................... 9  
   2.2 Population ..................................................................................................................................... 9  
   2.3 Recruitment ................................................................................................................................... 9  
   2.4 Data collection ............................................................................................................................... 10  
   2.5 Ethical considerations .................................................................................................................... 12  
   2.6 Informed Consent ......................................................................................................................... 13  
   2.7 Data handling and record keeping ............................................................................................... 13  
   2.8 Knowledge Management .............................................................................................................. 14  
   2.9 Prevention of infection in investigation personnel ...................................................................... 14  
3. Statistical Analysis .............................................................................................................................. 15  
   3.1 Sample size .................................................................................................................................... 15  
   3.2 Statistical considerations ............................................................................................................. 15  
4. Financing ............................................................................................................................................. 20  
5. References .......................................................................................................................................... 21  
6. Appendix A: Overview of Sampling Frames .................................................................................... 24  
7. Appendix B: Data Collection tool V2.0 ............................................................................................. 26  
8. Appendix C: Contextual data collected by study team at each round of data collection .............. 32  
9. Appendix D: Participant invitation example ..................................................................................... 34
Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>COVID-19</td>
<td>Coronavirus Disease 2019</td>
</tr>
<tr>
<td>HW</td>
<td>Health worker</td>
</tr>
<tr>
<td>IPC</td>
<td>Infection prevention and control</td>
</tr>
<tr>
<td>PPE</td>
<td>Personal protective equipment</td>
</tr>
<tr>
<td>SARS-CoV-2</td>
<td>Severe Acute Respiratory Syndrome coronavirus 2</td>
</tr>
<tr>
<td>TDR</td>
<td>Theoretical Domains Framework</td>
</tr>
<tr>
<td>WHO</td>
<td>World Health Organisation</td>
</tr>
</tbody>
</table>
1. Background

1.1 Introduction

Health workers play a central role in providing quality healthcare for those affected by SARS-CoV-2, the virus that causes COVID-19. To prevent health workers becoming infected, and to prevent nosocomial spread of COVID-19, a wide range of healthcare services must ensure that effective infection prevention and control (IPC) measures are adhered to (1). There are significant pressures on health workers (HWs) in providing care in emergency epidemic conditions. Recent reviews show that HWs are disproportionately affected by coronavirus outbreaks (2) and are at an increased risk to be infected with SARS-CoV-2 (2,3) and have reported high prevalence of depression, anxiety, psychological distress in HWs in areas impacted by COVID-19, (4), as well as at increased risk of attacks (5), further compounding the stress under which they perform their duties. Health workers also face the likelihood of stigma (which can trigger incidents of violence) due to perceptions that they have a high risk of spreading infection to both patients and colleagues, their community and families (6). Research conducted during the first SARS epidemic identified how organisational and social factors, including health worker confidence in their own ability to effectively adhere to IPC measures were important to protect both physical and psychological health (7).

In 2020 the World Health Organisation (WHO) published updated COVID-19 specific IPC guidelines for health workers (8,9). This guidance highlights the recommended IPC measures needed to prevent infection in healthcare settings such as the correct use of personal protective equipment (PPE), which is critical to reduce risk of infection in health workers.

Growing evidence shows that adherence to PPE measures and exposure to infection control training are associated with lower risk of SARS-CoV-2 infection (2,3,9). A recent review on barriers and facilitators of health workers’ adherence to IPC guidelines for infectious respiratory disease showed that several factors contributed to their willingness and ability to follow IPC protocols. These included effective communication of the guidelines, support from management, and access to/trust in PPE (10). More research is needed to generate evidence-based practices targeted at reducing risk of SARS-CoV-2 infections in health care settings and increasing health worker confidence and adherence to IPC measures.

1 At the time of publication, the guidance briefs cited were the most current
This protocol details a cross-sectional survey to evaluate perceptions of health workers’ individual and organizational preparedness to follow IPC measures in their place of work. Survey methods have been selected as an approach to rapidly capture perceptions among a targeted group of people. Methods should be reported following recommended reporting guidelines, including the limitations of survey methods, and with consideration of the impact of potential bias (sampling, measurement, non-response bias) on research outcomes (11).

This survey should help public health agencies, healthcare administrators, policy makers and other relevant decision makers to identify immediate areas of concern that need to be addressed to improve infection prevention and control in healthcare settings at local, regional and/or national levels.

1.2 Objectives

1.2.1 Primary Objective

To understand health worker perceptions of workplace preparedness to practice infection prevention and control measures implemented within their respective organisation to prevent COVID-19 transmission.

1.2.2. Secondary Objectives

1. To evaluate health worker perceptions of their individual preparedness to adhere to infection prevention and control measures to prevent transmission of COVID-19 in healthcare settings, and
2. To evaluate health workers’ collective level of trust in the healthcare organisation(s) in which they work.

3. To consider how these factors vary
   a. Across different epidemiological subgroups (i.e. age, gender, and job role);
   b. Between those who have direct experience of treating COVID-19 patients and those who do not;
   c. Between respondents whose healthcare facility is receiving suspected/confirmed COVID-19 patients and those whose healthcare facility is not (if applicable);
   d. Between countries in different global regions (if applicable).

4. To assess the current mental wellbeing of health workers during the COVID-19 pandemic.
5. To consider how current mental wellbeing varies:
   a. Across different epidemiological subgroups (i.e. age, gender, job role, other environmental factors);
   b. Between those who have direct experience of treating suspected/confirmed COVID-19 patients and those who have not;
   c. Between those who indicate different levels of infection prevention and control training.

2. Methods

2.1 Design and duration

Cross-sectional survey: for single or serial use.

2.2 Population

The WHO defines health workers as “all people engaged in actions with the primary intent of enhancing health including social care workers who often have roles in the provision of care in long-term care facilities and in community settings(9).”

For the purposes of this study, health workers are further described as follows:

**Health professionals** providing direct clinical care to patients in community, hospital, and/or ambulance emergency response settings. Including, but not limited to medical doctors, nurses, nursing assistants, allied health professionals, pharmacists, vaccinators, students and other roles with direct patient care.

**All other staff** involved in running or supporting clinical services in community, hospital, and/or ambulance emergency response settings, including in particular settings such as prisons. Populations of interest may include, but not be limited to senior managers, receptionists, other administrative roles, cleaners, porters, janitors and other non-clinical roles.

2.3 Recruitment

2.3.1 Sampling Design

Participants will be selected using a convenience sampling frame of the populations of interest (See Appendix A for a comparison of convenience sampling against other common
nonprobability and probability sampling methods). Data will be collected online through a standardized questionnaire facilitated by KoBoToolBox. For the purposes of rapid operational decision-making, use of non-probability sampling methods are suitable. However, limitations regarding external validity and generalizability of these methods should be highlighted. More information on sampling and study design for social science focused surveys can be found in the Guidance for Health Care Worker Surveys in humanitarian contexts in LMICs (12).

2.4 Data collection

2.4.1 Survey Tool

The data collection tool (Appendix B) for this study was rapidly developed by experts in WHO’s Social Science and IPC working group under the COVID-19 Research Roadmap. This study has been designed principally to provide information that will support actions that can be taken to better prepare or support frontline health workers to follow infection prevention and control measures when managing COVID-19 patients. Factors including wellbeing, perceptions of trust in healthcare settings along with contextual aspects related to country preparedness and COVID-19 epidemiology will influence the experience of health workers and study findings.

Cross-sectional surveys will provide a snapshot of health workers perceptions during the time that data are being collected. Together with dates and location of data collection, we recommend that implementing partners document key indicators relevant to context at each wave of data collection (See Appendix C). This will also facilitate cross-country comparison options for analysis. Despite expected variations in methods, results from researchers who use similar methods may be compared with each other.

Infection Prevention and Control

IPC items in the tool were adapted from WHO guidelines developed specifically for COVID-19. These include the Infection prevention and control guidance for long-term care facilities in the context of COVID-19 (October 2020) and the Rational use of personal protective equipment for COVID-19 and considerations during severe shortages (December 2020). At the time this revision of the protocol was published both of these guidance publications were

---

2 We anticipate many implementing partners will use non-probability sampling methods such as snowball or convenience sampling due to contextual factors including where the survey is being conducted and which facilities the research team has access to. For the purposes of rapid operational decision-making these methods are suitable. However, limitations regarding external validity and generalizability of these methods should be highlighted. Other implementing partners, for example those with access to a well-defined healthcare worker population (e.g. through a clinical network), may choose probability sampling methods. Broad considerations about sample selection are provided in Appendix A (29–31).
current. We recommend that this list is adapted to the context of the implementer to ensure consistency with local recommended IPC guidelines and availability of PPE.

*Health worker trust in institution*

Based on a previously validated measure, health workers’ trust in the institution where they worked was assessed by capturing three dimensions of institutional trust (competence, honesty, act in best interests of staff) (13).

*Health worker current mental wellbeing*

To capture health workers’ current mental wellbeing, the World Health Organisation Well-Being 5 (WHO-5) score is included in the data collection tool. The WHO-5 is a validated wellbeing measure consisting of 5 different statements, which are combined to calculate a WHO-5 wellbeing score per respondent. The WHO-5 is available in different languages (see https://www.psykiatri-regionh.dk/who-5/who-5-questionnaires/Pages/default.aspx).

*Contextual Aspects*

Describing contextual aspects related to the researchers’ country’s preparedness, COVID-19 epidemiological profile at the time of data collection is critical to framing the results of the study. The data collection tool captures COVID-19 epidemiology using WHO categories for transmission classification (14).

*Theoretical Domain Framework*

Once all of the questions for the tool were identified, the overarching framework of the tool was organized according to the Theoretical Domains Framework (TDF), a contemporary framework which has previously been applied to studying clinicians’ behaviour. The TDF has 14 domains which identify influences on behaviour that affect motivation, capability, and opportunity (15). These influences include aspects such as access to guidelines, materials to deliver effective preventative procedures, health worker perceptions of susceptibility to COVID-19, and trust in organisational readiness to manage spread of COVID-19.

*KoBoToolBox*

The data collection tool has been digitalized and pre-programmed into KoBoToolBox for rapid use. Optional modules are also available and can be added to the study tool via the KoBoToolBox ‘question bank.’

*Pilot Survey Tool*

Prior to data collection, the survey should be piloted with a small number of respondents for clarity. Language and wording should be checked.

**2.4.2 Data Collection**
Data will be collected via a standardized questionnaire administered as a pre-programmed online survey via KoBoToolbox. Optional additional modules can be added to the questionnaire via the question library in KoBoToolbox. Table 3 describes the strengths and limitations of the selected data collection strategy. While convenience sampling may be advantageous in settings with resource and time constraints, using a convenience sampling method increases the likelihood of selection bias. The strengths and limitations of convenience sampling methods should be considered in the reporting and interpretation of results (see Appendix A Tables 1 and 2 for general overview of sampling methods).

Table 3: Data Collection Strategies

<table>
<thead>
<tr>
<th>DATA COLLECTION STRATEGY</th>
<th>STRENGTHS</th>
<th>LIMITATIONS</th>
<th>RECOMMENDATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SELF-ADMINISTERED SURVEY (ONLINE)</td>
<td>Respondents can answer on their own time</td>
<td>Possible low response rate, easy to ignore invitation to complete</td>
<td>Connect with a gatekeeper/partner to prepare recipients for the email. This partnership may also aid the response rate</td>
</tr>
<tr>
<td></td>
<td>Less intrusive to a healthcare location/team</td>
<td>Will depend on internet, resources in location of interest</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Fewer staff needed on the research team</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Can be done remotely: No need to send teams into areas with COVID-19 infection</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital questionnaire can more easily prevent missing data by ensuring that “forced choice” answering is set</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Impersonality helps people report negative events, feelings, or behaviours</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Easier and faster to implement indifferent locations in a standardized, replicable way</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital questionnaire may be cheaper and easier than printing options</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2.5 Ethical considerations

Selected study sites must be engaged early on in the planning process to ensure appropriate

---

3 An online data collection and management tool is available through KoboToolbox at https://www.kobotoolbox.org/.

4 Implementing partners should specify the approach to data collection that is most suited to their context.
permissions are granted by local authorities. Ethical review or waiver procedures should take place in line with national guidelines. All study participants should be provided with information about the purpose of the survey (see Appendix D for recommended text), how their data will be used and their rights with regards to withdrawal from the study. Participants who choose voluntarily to answer the survey will be invited to indicate in a text box that they consent to take part. Participants who do not consent will exit the survey. Personally identifiable data should not be collected, and all data should be held confidentially. All data will be handled in accordance with national data protection regulations. Power relationships between respondents and implementers should be taken into consideration as well as potential hesitancy from health workers to respond ‘unfavourably’ about practices (not) implemented by their institutions.

2.6 Informed Consent

Informed consent will need to be obtained from all study participants. Participants will be informed of the purpose of the study and that participation is voluntary. Participants are free to withdraw at any time, without reason and without any effect on their professional responsibilities. This study poses minimal risks to the participants. Participants will indirectly benefit from the data collected as this will lead to better understanding of barriers and facilitators to IPC adherence and therefore to improved infection prevention and control. The study will be conducted in compliance with this protocol, the Declaration of Helsinki, good clinical practice and the applicable regulatory requirements. Ethical approval will be sought in accordance with national requirements.

2.7 Data handling and record keeping

Implementing partners will manage, process, analyse and store data according to their local or national processes and procedures. These procedures will be reviewed at local or national level to ensure they are sufficient to suitably protect respondent data. We recommend that personally identifiable data are not collected and that implementation teams work with management to avoid retaliation targeted at respondents for survey responses that may be viewed as critical of the facility. Data management plans should include information about how data will be stored, including levels of protection, who will have access to the data, and when it would be destroyed. In the event that data may need to be transferred, plans should specify how this would happen securely. In countries where data protection legislation exists, protocols should specify that data will be handled in accordance with those policies. For example, data management in the European Union must comply with the General Data Protection Regulation (GDPR).
2.8 Knowledge Management

Data Ownership
The data collected are owned by the participating investigators. The main priority of the protocol is to assist investigators in generating evidence that is tailored to their specific context and locally meaningful. However, Investigators are encouraged to share their data with WHO for future secondary analysis (ex. comparison across sites). Additionally, investigators are encouraged to share adapted instruments, methods and translated questionnaires via KoBoToolBox’s ‘datashare’ feature for reference by future researchers.

Data sharing
Cross-site learning to inform dissemination and implementation plans can be facilitated by encouraging sites to share specific strategies and templates used to share findings (E.g., presentations to policy makers) or to implement strategies at the local level (e.g., leadership engagement strategies). Knowledge exchange will be centralized through KoBoToolbox, which will serve as a hub for both survey items and dissemination/implementation guidance and knowledge exchange for this work.

Developing an implementation plan
To facilitate the development of an implementation plan, the WHO will provide participating investigators with guidance on how to interpret findings from an implementation perspective and select appropriate and relevant implementation strategies. Guidance will also be provided on logistical considerations for implementation (e.g., forming an implementation team). See

Report Writing
A report should be written following data analysis and shared at local, district, national and global levels. Peer reviewed publications, presentations to policy makers and other dissemination products are strongly encouraged. Implementing partners should work with their local WHO office prior to commencing the study to create a dissemination plan that will share results with key stakeholders, network(s) and/or institution(s).

2.9 Prevention of infection in investigation personnel
All personnel involved in the study need to be trained in IPC procedures (standard, droplet, contact and airborne precautions, as determined by national or local guidelines). These procedures should include proper hand hygiene according to the WHO 5 Moments and the
correct use of medical masks if necessary, not only to minimize the researcher’s own risk of infection when in close contact with health workers who have had potential exposure to a COVID-19 patient, but also to minimize the risk of spread among the health worker contacts of a COVID-19 patient. Researchers will be expected to complete the WHO online training course on Infection Prevention and Control (IPC) for Novel Coronavirus (COVID-19) available at: https://openwho.org/courses/COVID-19-IPC-EN

3. Statistical Analysis

3.1 Sample size

The sample size will need to be determined by statistical methods according to the study design (cross sectional survey), study population and the specific objectives of the study. Sample sizes can be calculated using statistical formulas or tools available online (for example, at: http://www.openepi.com/Menu/OE_Menu.htm) or in standard statistical packages. It is important to note that a larger sample size would be required if study sites want to stratify by effect modifier or to adjust for confounding factors.

3.2 Statistical considerations

Descriptive analyses, comparative analyses, and regression analyses are all potential approaches to data analysis, depending on the data collected and refinements of the research question(s) being asked. Please note that all information below is meant as guidance, and that statistical analyses should follow from local predefined research questions, hypotheses, and local needs for information.

3.2.1 Data cleaning

*WHO Wellbeing 5 (Q32-36)*

The individual answers to the five WHO-5 statements are used to calculate a WHO-5 wellbeing score per respondent. A raw score is calculated by totalling the answers of the five answers, with “all of the time” coded 5 and “at no time” coded 0. To obtain a total score ranging from 0 to 100, the raw score is multiplied by 4. A total score of 0 represents worst possible, whereas a score of 100 represents best possible wellbeing (see https://www.psykiatri-regionh.dk/who-5). This score can then be interpreted using different thresholds, e.g. thresholds used when screening for clinical depression (16).
Trust in health facility (Q37-39)
To assess trust, the survey tool contains three statements that capture different dimensions of trust – perceptions of competence, honesty, and actions that are in employees’ best interests (13). For analyses, these are combined into a single “Trust Score”. For example, if answers are reported on a 7-point Likert scale, ranging from “Strongly disagree” (0) to “Strongly agree” (7), these individual scores are summed up per individual, and divided by three.

3.2.2 Descriptive analyses
For each of the below, tabular or figure summaries can be presented. These can be stratified by contextual factors and/or subgroups, if applicable. The number and percentage of responders in each category could summarize categorical data. Continuous variables could be summarized by descriptive statistics, including mean, standard deviation, median, minimum, maximum and first and third quantiles (depending on (non-)normal distribution, see example Table).

Demographic information of study population
Describe the demographic characteristics of your study population and if available, present the nonresponse bias assessment.

Infection prevention and control (IPC) procedures used and knowledge of recommended IPC
Describe whether the IPC measures that were used by respondents comply with local or national protocols and policies. Describe the knowledge of recommended IPC procedures.

Preparedness and perceptions on IPC procedures (i.e. TDF domains)
Informed by the Theoretical Domains Framework (TDF), the survey tool was designed to collect information on the preparedness and perceptions of health workers on IPC procedures during the COVID-19 pandemic. Perceptions and experiences of health workers have been reported to be important factors in IPC and prevention of nosocomial transmission by acting as barriers or facilitators for adherence to IPC measures (10). These factors could roughly be categorized into three subdomains: 1) Organizational factors, such as having support by management, and availability of training programmes; 2) Environmental resources, such as the health facilities’ physical environment, and availability of PPE materials; and 3) Individual factors, such as individual knowledge and beliefs about the use of PPE. Researchers could report findings of the survey by these subdomains. These descriptive results could then be used to inform recommendations for routine clinical practice, by providing an overview of where strategies to optimize IPC adherence could focus.
WHO-5 Well-Being index (Q26-30)

For the WHO-5 wellbeing index, consider presenting the prevalence of health workers who score <50 points on the WHO-5 wellbeing index. A score below 50 is a cut-off score that can be used to a screening diagnosis of clinical depression (16).

3.2.3 Bivariable analyses (Differences between groups)

Authors should assess whether responses to statements, perceptions, or WHO-5 wellbeing scores, are statistically significantly different between subgroups. Use appropriate statistical tests when making statistical comparisons. These will depend on the number of groups and the type of data (i.e. continuous or categorical, (non-)normality). A P value < .05 is generally considered statistically significant. Keep in mind the risk of type I error in case of multiple comparisons, i.e. finding a statistically significant result by chance and erroneously inferring conclusions. It is therefore important to predefine and limit the number of statistical comparisons.

We recommend investigating differences in gender, particularly related to wellbeing (17,18), differences between professional job roles (17,19,20), differences between front line staff (those working with COVID-19 patients) and those working in health facilities but not working directly with COVID-19 patients (17,19,21). If relevant, analyses to explore differences related to geographic region and past experience working in a respiratory epidemic and/or pandemic are also recommended.

3.2.4 Multivariable regression analyses

Multivariable analyses allow for more in-depth examination of the data and can for example be performed to explore independent associations between environmental context, behavioural and social factors, and current mental wellbeing, while adjusting for confounding factors. Depending on a continuous or binary outcome variable, linear or logistic regression models are used, respectively. All model assumptions should be checked. Outcome variables, variables of interest, and confounding variables should be predefined (22). The difference between causal and predictive modelling should be noted as well as the difference between confounding variables and effect modifiers. Authors are aware that (univariable or multivariable) association does not imply causation. For more information, please refer to online resources such as provided below.
3.2.5 Other considerations

Missing data

Determine upfront whether only surveys that are fully completed will be included in the analyses (i.e. complete case analysis), or whether records with incomplete survey completion will be included as well (and what % should be at least completed, for example 50%). In case of deciding to use records with missing data on multiple statements, assess whether the data is missing (completely) at random. If so, you can consider using multiple imputation techniques to impute missing values.

Nonresponse bias

It is important to investigate possible nonresponse bias. Nonresponse bias can arise if persons that decide to participate in the study are systematically different from those that do not respond, which is an important limitation of survey studies (23,24). If applicable to your study design, and if possible, collect denominator data on how many persons were invited to participate in the study and calculate a response rate from your sample (N responding/total N invited). Ideally, demographic information (e.g. age, gender, job role) of responders is compared to demographic information of non-responders or to the entire group of invited persons. Some approaches to sampling do not allow for evaluation of nonresponse bias, in which case this limitation should be considered when reporting and presenting findings.

External validity

Consider to what level the study population is representative of all health workers to which study results will be extrapolated. In other words: is it valid to assume that the conclusions derived from the study are applicable to health workers that were not invited, or that did not participate in the study. Note that convenience samples do not usually result in generalizable results and are difficult to base extrapolations on.

Epidemiological situation

Carefully describe the local epidemiological context regarding COVID-19 (i.e. case numbers, national restrictions) during each period when survey data collection was performed, for interpretation of results. Also report the WHO transmission category and response capacity (25) (see Appendix C).

5 For background information on the design and conduct of surveys among health workers, see the informative paper by Burns et al. (2008): “A guide for the design and conduct of self-administered surveys of clinicians”.
Reporting

Follow reporting guidelines on survey research for reporting your results (11). For background information, you can also check the STROBE checklists and appropriate extension (i.e. cross-sectional) for more information on reporting of study results of observational studies (available via www.strobe-statement.org)(26). If relevant researchers should consult reporting guidelines for mixed methods studies (27,28).

3.2.6 Example tables and figures

Below are example tables and figures of how data could be presented. Please note that these are examples only; variables, categories, and subgroups can differ per implementing group and should fit local data collection. Definitions should be provided for each variables, categories, subgroups and groups.

Table X. Demographic information of participating health workers (HW).

<table>
<thead>
<tr>
<th></th>
<th>All HW</th>
<th>Subgroup 1</th>
<th>Subgroup 2</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N = XX (%)</td>
<td>N = XX (%)</td>
<td>N = XX (%)</td>
</tr>
<tr>
<td><strong>In case of (large enough) subgroups, could be interesting to present demographics per subgroup, i.e. job role, region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age, mean (±SD)¹</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Female</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Living situation*</td>
<td></td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Single</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Living with partner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>....</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Having caring responsibilities for other adults*</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Type of healthcare service*</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Primary healthcare</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Hospital</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>....</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Medical specialty*</td>
<td></td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Internal medicine</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Acute care (anaesthesiology, ER, ICU)</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Surgery</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Other</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Job role*</td>
<td></td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Senior medical doctor</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Junior medical doctor</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Nurse</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>...</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Full-time employment*</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Years of experience, median (Q1-Q3)*¹</td>
<td>xx (X-X)</td>
<td>xx (X-X)</td>
<td>xx (X-X)</td>
</tr>
<tr>
<td>Daily patient contact*</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
<tr>
<td>Personally cared for COVID-19 patient*</td>
<td>xx (X)</td>
<td>xx (X)</td>
<td>xx (X)</td>
</tr>
</tbody>
</table>
Check normal distribution and present mean or median, accordingly.
* These are example variables. Variables, categories and subgroups can differ per implementing group. If applicable, provide definitions that were used.

<table>
<thead>
<tr>
<th>Table X. WHO 5-item wellbeing score per subgroup</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Mean WHO-5 (±SD)</strong></td>
</tr>
<tr>
<td><strong>P value</strong></td>
</tr>
<tr>
<td>All respondents (N=XX)</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Job role*</td>
</tr>
<tr>
<td>Nurse</td>
</tr>
<tr>
<td>Medical doctor</td>
</tr>
<tr>
<td>Other possible roles</td>
</tr>
<tr>
<td>COVID-19 patient care / frontline health worker*</td>
</tr>
<tr>
<td>Personally cared for COVID-19 patient</td>
</tr>
<tr>
<td>Not personally cared for COVID-19 patient</td>
</tr>
<tr>
<td>Other subgroup*</td>
</tr>
<tr>
<td>NA, not applicable; NS, not significant, WHO, World Health Organization</td>
</tr>
</tbody>
</table>
* These are example variables. Variables, categories and subgroups can differ per implementing group. If applicable, provide definitions that were used.

**Figure X.** Example of how to present descriptive information on perceived skills and environmental context. (this figure was made with Likert function in R package “HH”)

**4. Financing**

Resources incurred to implement this protocol should be funded by funding sources identified by the investigators.
5. References


2. Chou R, Dana T, Buckley DI, Selph S, Fu R, Totten AM. Epidemiology of and Risk Factors for Coronavirus Infection in Health Care Workers A Living Rapid Review. 2020;


5. By Insecurity Insight, the Researching the Impact of Attacks on Healthcare project (RIAH) and the Safeguarding Health in Conflict Coalition (SHCC).


12. (No Title).


27. O’Cathain A, Murphy E, Nicholl J. The quality of mixed methods studies in health services research. J Heal Serv Res Policy [Internet]. 2008 Apr 21 [cited 2021 May
Perceptions of Health workers regarding local infection control and prevention procedures for COVID-19: Research Protocol
5 May 2021


### 6. Appendix A: Overview of Sampling Frames

**Table 1: Sample Selection Methods**

<table>
<thead>
<tr>
<th>SAMPLE SELECTION METHOD</th>
<th>DESCRIPTION AND REASONING</th>
<th>PROS</th>
<th>CONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NON-PROBABILITY, PURPOSEFUL SAMPLING (SEE TABLE 2 FOR MORE DETAIL ON SPECIFIC METHODS)</td>
<td>Used when there are specific, predefined groups in mind to access</td>
<td>Can create a sample to meet the needs of the study</td>
<td>Not necessarily representative of population</td>
</tr>
<tr>
<td></td>
<td>Used when there are clear eligibility/inclusion requirements for groups</td>
<td>Can target hard-to-reach populations</td>
<td>Generalizability is typically not possible</td>
</tr>
<tr>
<td></td>
<td>Used for situations where researchers need to reach a targeted sample quickly</td>
<td>Flexible for unclear feasibility of sampling during an outbreak</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Used when sampling for proportionality is not the primary concern</td>
<td>Useful for the piloting of instruments and a study protocol</td>
<td></td>
</tr>
<tr>
<td>PROBABILITY, SIMPLE RANDOM SAMPLING</td>
<td>The ideal form of sampling as it yields an unbiased sample that is representative of the population of interest</td>
<td>Yields representative and generalizable findings</td>
<td>This approach takes substantial amounts of time, money, resources, and staff</td>
</tr>
<tr>
<td></td>
<td>Creates a representative list of possible participants which all have equal opportunity to be recruited</td>
<td>The systematic and randomization nature of the approach limits biases</td>
<td>An accurate and complete sampling frame is essential, if compiling one is not feasible this method will not work</td>
</tr>
<tr>
<td></td>
<td>Requires all, or close to all, of the possible participants to be included in the sampling frame</td>
<td>The simple random sampling method is the simplest form of this probability approach</td>
<td>It is imperative to adhere to a randomized sampling technique which may be less convenient than nonprobability sampling methods</td>
</tr>
<tr>
<td></td>
<td>Each person is selected independently and may be selected only one time</td>
<td></td>
<td>Focus is not on the sizes / proportions of groups therefore analysis among subgroups may be difficult</td>
</tr>
</tbody>
</table>
Table 2: Non-probability sampling approaches

<table>
<thead>
<tr>
<th>Sampling Approach</th>
<th>Reasoning</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Quota sampling</strong></td>
<td>Researchers divide the population into subgroups (e.g. by health worker role), which have already been outlined by this protocol</td>
<td>Attention to sampling for comparison groups may aid and/ or strengthen analysis</td>
<td>It may be difficult to calculate or estimate accurate proportions It may be the fastest and least labour-intensive option if it is anticipated that response will be low and recruitment will be difficult</td>
</tr>
<tr>
<td></td>
<td>Researchers can obtain health facility human resources records to estimate the proportion of the population in each group</td>
<td></td>
<td>This approach may not be possible if the facilities do not have accurate or up to date human resource records</td>
</tr>
<tr>
<td><strong>Convenience sampling</strong></td>
<td>Ideal in a situation with unknown sampling feasibility or resources</td>
<td>May be the fastest and least labour-intensive option if it is anticipated that response will be low and recruitment will be difficult</td>
<td>This approach is often less intrusive than other sampling methods</td>
</tr>
<tr>
<td></td>
<td>Convenience sampling aims to recruit participants who are readily available</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Snowball sampling</strong></td>
<td>May be useful since the population of interest is mostly comprised of colleagues</td>
<td>This approach is typically utilized when a full participant list is unavailable</td>
<td></td>
</tr>
<tr>
<td></td>
<td>May be useful to use networks to build off of convenience sample and create a sample with properties of a probability sample</td>
<td>Under a certain set of assumptions final sample may have high statistical validity and reduced bias</td>
<td>Requires strict adherence to rigorous implementation procedures in order to elevate statistical validity</td>
</tr>
</tbody>
</table>
7. Appendix B: Data Collection tool V2.0

Introductory text
This survey aims to understand how healthcare professionals feel regarding their preparedness to deliver infection prevention and control (IPC) procedures in healthcare settings during the COVID-19 pandemic.

The information we collect will help improve preparedness to prevent health workers becoming ill and to effectively prevent spread of COVID-19. In this survey, we refer to infection prevention and control procedures that should be adopted when managing patients with suspected or confirmed COVID-19. For reference, relevant [national/ regional/ local]* guidelines can be found here [ADD LINK]6

All data will be stored and processed in accordance with national regulations. Approvals for this study have been obtained from [NAME].

If you are willing to take part in this study, please confirm the following: yes/ no
- I understand that my participation is completely voluntary
- I would like to take part in this study

Demographic information

<table>
<thead>
<tr>
<th>Variable</th>
<th>Format options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Number</td>
</tr>
<tr>
<td>Gender</td>
<td>Standard formats</td>
</tr>
<tr>
<td>Role*</td>
<td>For example: Senior medical doctor, junior medical doctor, nurse, allied health professional, assistant, administrative, non-clinical, other</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of healthcare service*</th>
<th>Primary Health Care / Hospital: Medical unit, surgical, intensive care, paediatric, emergency, infectious disease ward, maternity, other / Ambulance</th>
</tr>
</thead>
</table>

Screening question: do you provide direct care to patients? Yes/ no/ not sure IF YES, how frequently do you provide direct patient care? 1) daily 2) more than one day per week, 3) less than one day per week, 4) rarely, 5) no patient contact, 6) don’t know]

Employment status* Fulltime/ part time/ casual or locum staff/ retired/ student/ other*

What is your current* living situation? Living alone Living with others

*Please select the option that was best applicable during the majority of the time during the past 2 weeks

Do you have caring responsibilities for any adults, including those with disabilities or those over the age of 70 years?

Have you personally been diagnosed with COVID-19?

If you have been diagnosed with COVID-19 was this laboratory and/or radiologically confirmed?

*Adjust as needed to be country specific. Make sure definitions are provided to your respondents and in your reporting.

**Experience of COVID-19 or previous epidemic**
Response options: [yes/ no/ unsure]

1. In a clinical setting, have you previously worked during an acute respiratory epidemic or pandemic, for example, SARS (2002), MERS Co-V (2012), H1N1 (2009)?

2. In a clinical setting, did you personally care for patients with suspected or confirmed infection caused by a novel respiratory pathogen, for example, SARS (2002), MERS Co-V (2012), H1N1 (2009)?

3. Has a patient with suspected or confirmed COVID-19 attended the health facility in which you work?

4. Have you personally provided direct medical care to a patient with suspected or confirmed COVID-19 infection?

**IF YES to 4:**

5. What type of medical contact did you have with a suspected/confirmed COVID-19 case?
   A. Close contact: directly caring for a suspected/confirmed patient or being within a 1-2m radius of a suspected/confirmed patient
      i. IF A: Did this contact include an aerosol generating procedure? For example, tracheal intubation, non-invasive ventilation, bronchoscopy, cardiopulmonary resuscitation.
   B. Healthcare contact: no direct contact with suspected/confirmed COVID-19 case, but was present on the ward when they were cared for.
   C. Unknown / unsure

6. What kind of infection prevention procedures did you use during your most recent medical contact with a suspected/confirmed COVID-19 patient?

*note: combine with the response given to Q5 (for example, did the health worker have a close contact with or without an aerosol-generating procedure) in order to infer adherence to*
infection prevention and control recommendations.

- Hand hygiene
- N95 respirator (FFP2 or equivalent)
- Other types of medical mask (if yes, which one)
- Fluid-resistant long-sleeved gown
- Disposable apron
- Gloves
- Full body suit
- Eye protection (i.e. goggles or face shield)
- Single use equipment
- No specific equipment
- Other….

Questions regarding infection prevention and control procedures for management of patients with suspected or confirmed COVID-19

The following questions relate to your experience of managing patients in the healthcare setting where you work. Please think about your experience over the past week when responding to these questions.

Response options: 7 point Likert scale: strongly disagree, disagree, somewhat disagree, neither agree nor disagree, somewhat agree, agree, strongly agree.

Service demand
7. I am confident that the healthcare service where I work can manage current patient demand related to COVID-19
8. I am confident that the healthcare service where I work can continue to manage patient demand related to COVID-19 over the next 3 months.

Knowledge of recommended infection prevention and control procedures
9. When providing direct medical care to suspected or confirmed COVID-19 patients, excluding during aerosol-generating procedures, which of the following procedures are currently recommended in your country for preventing transmission?

- Hand hygiene
- N95 respirator (FFP2 or equivalent)
- Other types of medical mask (if yes.. which one)
- Fluid-resistant gown
- Disposable apron
- Gloves
- Full body suit
- Eye protection (i.e. goggles or face shield)
- Single use equipment
- Other…. Open txt field
**Skills**
10. I feel I have received sufficient training in the infection prevention and control practices specifically for COVID-19
11. I have received general training for infection prevention and control procedures for other communicable diseases

**Beliefs about capabilities**
12. I am confident that I am able to follow recommended procedures related to personal protective equipment (PPE) for COVID-19 e.g. appropriate use and disposal of gloves, apron and fluid resistant surgical mask

**Social/professional role**
13. I feel it is my professional responsibility to take all measures necessary to care for COVID-19 patients.

**Beliefs about consequences**
14. I consider that the protective procedures at work are sufficiently effective to prevent the spread of COVID-19 in the health facility where I work
15. Following the infection prevention and control recommendations will protect me from becoming ill with COVID-19
16. Following recommended infection, prevention and control procedures adds significant additional strain to my workload.

**Intentions**
*If you are currently not providing direct care to COVID-19 patients, please think of a future possible situation where you would, when answering this question*

17. I intend to always use the recommended personal protective equipment (medical mask, eye protection, gown and gloves) when taking care of patients with suspected or confirmed COVID-19 when I have access to these.

**Environmental context and resources**
18. In the health facility where I work, I have access to clear policies and protocols for everyone to follow related to infection prevention and control procedures for COVID-19
19. I can easily access personal protective equipment (PPE) in line with standard infection control precautions, for example, gloves, gown, eye protection and medical mask for COVID-19 in the hospital where I work
20. During my last clinical shift, I had adequate supplies of the following materials:
   - Hand alcohol
   - Hand soap
   - Running water
   - N95 respirator (FFP2 or equivalent)
   - N95 respirator (FFP1 or equivalent)
   - Surgical mask
• Fluid-resistant gown
• Disposable apron
• Gloves
• Full body suit
• Eye protection (i.e. goggles or face shield)

21. In the health facility where I work there are dedicated isolation facilities for patients with COVID-19
22. The health facility where I work receives good support from national/ regional/ local public health authorities, who provide guidance and training on how to manage COVID-19

Social Influences
23. Most of my colleagues regularly follow infection prevention and control measures (for example, regular hand washing, use of personal protective equipment, proper disposal of equipment)
24. It is expected that in my role as a healthcare professional that I will follow infection prevention and control measures.
25. I am encouraged and supported by senior medical/nurse staff to apply recommended infection prevention and control measures.
26. The local community where I currently live day-to-day are generally supportive of health workers.

Emotion
27. I am concerned about the risk to myself of becoming ill with COVID-19
28. I am concerned about the risk to my family related to COVID-19 as a result of my job role
29. I am afraid of looking after patients who are ill with COVID-19
30. I accept that the risk of getting COVID-19 is part of my job
31. Whether I get infected with COVID-19 is within my control

WHO Wellbeing 5: Over the last two weeks
Note (2): these 5 questions are combined in the analysis to create a single “wellbeing” score.

Response option for this question: all of the time; most of the time; more than half of the time; less than half of the time; some of the time; at no time):
32. I have felt cheerful and in good spirits
33. I have felt calm and relaxed
34. I have felt active and vigorous
35. I woke up feeling fresh and rested
36. My daily life has been filled with things that interest me

[ Please provide information to your respondents on local resources for mental and psychological support ]
Trust in health facility
Note: these 3 questions are combined in the analysis to create a single “trust” score
37. The health facility where I work is ready to manage COVID-19
38. The health facility where I work are being honest with staff when managing COVID-19
39. The health facility where I work would act in the best interests of its staff when managing COVID-19

Comment
8. Appendix C: Contextual data collected by study team at each round of data collection

The study team should collect the following information for each round of data collection. If the survey is conducted in multiple countries, these data should be captured for each country included in data collection.

Dates of data collection: __/__/__ to__/__/__

<table>
<thead>
<tr>
<th>Dates of data collection</th>
<th><strong>/</strong>/__ to__/<strong>/</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Country Name:</td>
<td></td>
</tr>
<tr>
<td>WHO Transmission Category</td>
<td></td>
</tr>
<tr>
<td>WHO Response Capacity Situation Level</td>
<td></td>
</tr>
<tr>
<td>IHR SPAR Average Score (%0)</td>
<td></td>
</tr>
</tbody>
</table>

WHO Situational Assessment: Assessing level of COVID-19 transmission and response capacity

WHO provides guidance for its member states to assess transmission of COVID-19 and capacity to respond to the COVID-19 pandemic at national and sub-national levels. The full guidance including the situational matrix is included in *Considerations for implementing and adjusting public health and social measures in the context of COVID-19.* Researchers should consult this guide to determine the transmission category and response capacity levels using the situational matrix.

Country Level Preparedness – international Health Regulations (IHR)

The revised International Health Regulations (IHR) are a set of legal instruments designed to ensure and improve the capacity of all signatories or States Parties to prevent, detect, assess, notify, and respond to public health risks and acute events. Under the IHR, States Parties are obliged to develop and maintain minimum core capacities for surveillance and response to any potential public health events of international concern.

The SPAR (State Party Self-Assessment Annual Reporting) tool consists of 24 indicators for the 13 IHR capacities needed to detect, assess, notify, report and respond to public health risk and acute events of domestic and international concern. For each of the 13 capacities, one to three indicators are used to measure the status of each capacity that is then converted to an overall percentage score. Each capacity

---

has a percentage score. Researchers are encouraged to visit the SPAR webtool\(^8\) and document the percentage scores for each of the 13 capacities (Table 2) for their respective countries.

<table>
<thead>
<tr>
<th>IHR SPAR</th>
<th>Capacity Score (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Capacities (average)</td>
<td></td>
</tr>
<tr>
<td>C1 Legislation and Financing</td>
<td></td>
</tr>
<tr>
<td>C2 IHR Coordination and National IHR Focal Point Functions</td>
<td></td>
</tr>
<tr>
<td>C3 Zoonotic Evens the Human-animal Interface</td>
<td></td>
</tr>
<tr>
<td>C4 Food Safety</td>
<td></td>
</tr>
<tr>
<td>C5 Laboratory</td>
<td></td>
</tr>
<tr>
<td>C6 Surveillance</td>
<td></td>
</tr>
<tr>
<td>C7 Human Resources</td>
<td></td>
</tr>
<tr>
<td>C8 National Health Emergency Framework</td>
<td></td>
</tr>
<tr>
<td>C9 Health Service Provision</td>
<td></td>
</tr>
<tr>
<td>C10 Risk Communication</td>
<td></td>
</tr>
<tr>
<td>C11 Points of Entry</td>
<td></td>
</tr>
<tr>
<td>C12 Chemical Events</td>
<td></td>
</tr>
<tr>
<td>C13 Radiation Emergencies</td>
<td></td>
</tr>
</tbody>
</table>

\(^8\) State Party Self-Assessment Annual Reporting tool (SPAR) Capacity Scores can be found at [https://extranet.who.int/e-spar#capacity-score](https://extranet.who.int/e-spar#capacity-score)
9. Appendix D: Participant invitation example

You have been invited to take part in this research survey. Participation is voluntarily. Before you decide to participate, please read the following information on why this research is being done and what will happen to your responses.

The survey will ask you about your opinions, past experience, and current practices regarding local infection prevention and control procedures for COVID-19.

As the COVID-19 pandemic progresses, there is increasing pressure on health workers on the frontline to provide care in epidemic conditions, across different countries and clinical settings. To identify immediate areas of concern that need to be addressed, we need to understand how health workers view their preparedness to deliver effective infection prevention and control procedures in their place of work.

You have been invited to take part in this survey because you are a health professional providing direct clinical care to patients, or a staff member involved in running clinical services, in community, hospital, and/or ambulance emergency response settings.

It is up to you to decide whether or not to take part. If you do take part, we will ask you to provide consent. You can withdraw your participation and/or information at any time, without giving a reason.

All information will be confidential and securely stored.

Information collected in this survey may be shared in an anonymised form to allow reuse within the research team and other third parties for COVID-19 health service related research only.

For questions, concerns or complaints about any aspect of this study, please contact [DETAILS HERE].