













STUDY PROTOCOL

COVID-19 Social Science and Public Engagement Action Research in Vietnam, Indonesia and Nepal (SPEAR): Protocol for a mixed methods study exploring the experiences and impacts of COVID-19 for healthcare workers and vulnerable communities [version 1; peer review: 1 approved with reservations]

Jennifer Ilo Van Nuil ^{1,2}, Dewi Friska ³, Aria Kekalih³, Anup Raj Bhandari⁴, Claus Bogh⁵, Hannah Brindle ⁶, Thi Hong Ngoc Bui⁷, Dinesh Deokota⁸, Soraya Weldina Ragil Dien⁹, Phuong Nhung Doan¹, Jaom Fisher¹, Amit Gautum¹⁰, Livia Nathania Kurniawan⁹, Ralalicia Limato ^{2,9}, Hoang Yen Nguyen¹, Thanh Ha Nguyen¹, Thanh Phong Nguyen⁷, Thanh Truong Nguyen⁷, Thi Hong Yen Nguyen^{1,2}, Thi Kim Ngoc Nguyen¹, Thi Kim Tuyen Nguyen ¹¹, Thao My Nguyen Le¹, Aakriti Pandey¹⁰, Samita Rijal¹⁰, Chrissy Roberts⁶, Rabi Shakya⁴, Summita Udas Shakya ¹⁰, Pawan Sharma⁴, Ida Aya Sutrisni⁹, Pratibha Thapa¹⁰, Diana Timoria⁵, Minh Hien Tran¹, Phuong Thao Tran ¹¹, Thi Hang Tran¹¹, Bao Hung Vu¹, Tien Viet Dung Vu ¹¹, OUCRU COVID-19 research group, Abhilasha Karkey^{2,10}, Raph L Hamers ^{2,3,9}, Mary Chambers ^{1,2}, Sonia Lewycka^{2,11}

¹Oxford University Clinical Research Unit, Ho Chi Minh City, Vietnam

²Nuffield Department of Medicine: Tropical Medicine and Global Health, University of Oxford, Oxford, UK

³Department of Community Medicine, Faculty of Medicine, Universitas Indonesia, Jakarta, Indonesia

⁴Patan Academy of Health Sciences, Kathmandu, Nepal

⁵Sumba Foundation, Sumba, Indonesia

⁶London School of Hygiene Tropical Medicine, London, UK

⁷Hospital for Tropical Diseases, Ho Chi Minh City, Vietnam

⁸Media for Development, Kathmandu, Nepal

⁹Eijkman Oxford Clinical Research Unit, Jakarta, Indonesia

¹⁰Oxford University Clinical Research Unit, Kathmandu, Nepal

¹¹Oxford University Clinical Research Unit, Hanoi, Vietnam

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Abstract

Background: When the novel coronavirus – SARS-CoV-2 – started to spread globally, there was a call for social and behavioral scientists to conduct research to explore the wider socio-cultural contexts of coronavirus disease 2019 (COVID-19), to understand vulnerabilities, as well as to increase engagement within communities to facilitate adoption of public health measures. In this manuscript, we describe the protocol for a study conducted in Indonesia, Nepal, and Vietnam. In the study, we explore how the COVID-19 pandemic is affecting individuals and their communities. We focus on the wider health and economic impacts of COVID-19, in particular emerging and increased burden on mental health, as well as new or deepened vulnerabilities in the communities. The introduction of vaccines has added another layer of complexity and highlights differences in acceptance and inequalities around access.

Methods: We use mixed methods, combining survey methods and social media surveillance to gain a picture of the general situation within each country, with in-depth qualitative methods to gain a deeper understanding of issues, coupled with a synergistic engagement component. We also include an exploration of the role of social media in revealing or driving perceptions of the pandemic more broadly. Participants include health workers and members of communities from 13 sites across the three countries. Data collection is spread across two phases. Phase 1 is concerned with exploring lived experiences, impacts on working lives and livelihoods, mental health and coping strategies. Phase 2 is concerned with acceptance of COVID-19 vaccines, factors that increase and reduce acceptance, and factors that influence access.

Conclusions: We will disseminate findings in multiple ways including short reports and policy briefs, articles in peer-reviewed journals, and digital diaries will be edited into short films and uploaded onto social media sites.

Keywords

COVID-19, mixed methods, healthcare workers, vulnerable communities, lived experiences, mental health, Indonesia, Nepal, Viet Nam



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1. **Phaik Kin Cheah** , Universiti Tunku Abdul Rahman, Perak, Malaysia

Any reports and responses or comments on the article can be found at the end of the article.

Corresponding author: Jennifer Ilo Van Nuil (jvannuil@oucru.org)

Author roles: **Van Nuil JI:** Conceptualization, Funding Acquisition, Supervision, Writing – Original Draft Preparation; **Friska D:** Conceptualization, Supervision, Writing – Review & Editing; **Kekalih A:** Conceptualization, Supervision, Writing – Review & Editing; **Bhandari AR:** Supervision, Writing – Review & Editing; **Bogh C:** Supervision, Writing – Review & Editing; **Brindle H:** Conceptualization, Writing – Review & Editing; **Bui THN:** Conceptualization, Supervision, Writing – Review & Editing; **Deokota D:** Conceptualization, Supervision, Writing – Review & Editing; **Ragil Dien SW:** Project Administration, Writing – Review & Editing; **Doan PN:** Writing – Review & Editing; **Fisher J:** Project Administration, Writing – Review & Editing; **Gautum A:** Writing – Review & Editing; **Kurniawan LN:** Writing – Review & Editing; **Limato R:** Supervision, Writing – Review & Editing; **Nguyen HY:** Writing – Review & Editing; **Nguyen TH:** Writing – Review & Editing; **Nguyen TP:** Conceptualization, Supervision, Writing – Review & Editing; **Nguyen TT:** Supervision, Writing – Review & Editing; **Nguyen THY:** Project Administration, Writing – Review & Editing; **Nguyen TKN:** Project Administration, Writing – Review & Editing; **Nguyen TKT:** Writing – Review & Editing; **Nguyen Le TM:** Writing – Review & Editing; **Pandey A:** Writing – Review & Editing; **Rijal S:** Project Administration, Writing – Review & Editing; **Roberts C:** Conceptualization, Writing – Review & Editing; **Shakya R:** Supervision, Writing – Review & Editing; **Shakya SU:** Writing – Review & Editing; **Sharma P:** Supervision, Writing – Review & Editing; **Sutrisni IA:** Writing – Review & Editing; **Thapa P:** Writing – Review & Editing; **Timoria D:** Writing – Review & Editing; **Tran MH:** Writing – Review & Editing; **Tran PT:** Writing – Review & Editing; **Tran TH:** Project Administration, Writing – Review & Editing; **Vu BH:** Writing – Review & Editing; **Vu TVD:** Visualization, Writing – Review & Editing; **Karkey A:** Conceptualization, Funding Acquisition, Supervision, Writing – Review & Editing; **Hamers RL:** Conceptualization, Funding Acquisition, Supervision, Writing – Review & Editing; **Chambers M:** Conceptualization, Funding Acquisition, Supervision, Writing – Review & Editing; **Lewycka S:** Conceptualization, Funding Acquisition, Supervision, Writing – Original Draft Preparation

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Introduction

Covid-19 and vulnerabilities

When the novel coronavirus – severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) – first emerged in Wuhan, China in late 2019, and started to spread across the world, there was a call for social and behavioral scientists to conduct research to explore the wider socio-cultural contexts of coronavirus disease 2019 (COVID-19) across a variety of communities, to understand vulnerabilities, as well as to increase engagement within communities to facilitate adoption of public health measures^{1,2}. As the pandemic progressed, biological vulnerabilities became apparent, such as higher risk of severe disease among the elderly and those with co-morbidities^{3,4} and mental distress among the healthcare workforce⁵. The introduction of public health measures brought into focus another set of vulnerabilities, related to impacts on other health conditions, mental wellbeing and livelihoods⁶.

The idea of vulnerability spans from the dynamics of pre-existing vulnerability within communities and health systems, to policies and measures that potentially make groups more vulnerable, to understanding how new and existing forms of vulnerability are being shaped by COVID-19⁷. For example: healthcare workers thrust into new, high-risk, high-stress roles without adequate support may suffer mental fatigue; movement restrictions mean cancellation or delays in seeking care for other health conditions; broken supply chains mean that medicines and food may not reach everyone who needs it, especially in remote areas; and social distancing for those who are already socially isolated, such as the elderly or those with disabilities, may increase mental health problems. The wider health and socio-economic impacts of COVID-19 will have disproportionate effects on the most vulnerable and may work to deepen existing inequalities. Understanding challenges and motivations to engage in social distancing and other public health responses within more vulnerable communities may help inform strategies to increase engagement, reduce transmission, and improve mental and social health, while also mitigating the adverse consequences of the COVID-19 response and other risks⁸.

Health and economic impacts

Researchers are continuing to identify multiple social, economic, and ethical consequences of COVID-19, containment and other public health measures, as well as multiple social responses (e.g. solidarity, blame, xenophobia) that have surfaced alongside the formal public health responses. Although many of the public health measures are universal (e.g. quarantine, contact tracing) and have been used for decades in epidemic control, the ways in which specific societies and individuals respond to them are based on the historical, cultural, political, and economic contexts in which people experience them. As a key example, stringent social distancing or ‘lockdown’ measures to reduce the transmission of COVID-19 have been brought into effect very early in many countries, in order to avoid putting additional strain on already overstretched healthcare systems⁷. However, the experiences and consequences of lockdown for communities likely include a range of unintended health and other outcomes not initially considered by public health

officials⁹. Additionally, these lockdown measures have had far-reaching effects on people’s ability to sustain their livelihoods everywhere. In many higher income countries, these impacts have been mitigated through policies like the provision of food, money, or financial support for small businesses. By contrast, in low- and middle-income countries (LMIC), these safety nets are often lacking or insufficient, and everywhere, the impact of losses of income is felt most harshly in groups considered more vulnerable prior to the pandemic.

Impact of COVID-19 on healthcare workers

Within all communities, there are a variety of healthcare workers (HCWs), health related staff, and community healthcare workers (CHWs) working in roles that potentially make them more physically vulnerable to COVID-19, as well as at risk for increased stress and anxiety about COVID-19, among many other things (e.g. transmission of infection to family)⁵. An early study in Hubei province, China found that over 50% of healthcare workers who were exposed to COVID-19 reported symptoms of depression and 71.5% reported symptoms of distress¹⁰. The potential for experiencing stress and anxiety in the context of COVID-19 goes beyond medical staff and reaches nonmedical healthcare staff as well. In a study in Singapore, the prevalence of anxiety was higher in nonmedical health care workers when compared with medical staff (20.7% and 10.8%, adjusted)¹¹. Further, shortages of personal protective equipment (PPE), as well as inappropriate use of PPE, creates a more vulnerable environment for HCWs and health related staff, and has been a global concern since the start of the pandemic¹². These situations are important to assess and understand, as well as use to inform engagement programs that could offer HCWs and related healthcare staff a more supportive environment.

In order to reduce transmission and prevent a surge of cases in hospitals, many countries, including LMICs, have relied heavily upon networks of CHWs to implement and enforce COVID-19 related public health actions. Rapid dissemination of public health information, contact tracing, management of community isolation/quarantine, and testing of potential cases has been crucial, and now all three countries where the study is taking place are moving into a phase of rolling out SARS-CoV-2 vaccines. These additional duties may place stress upon CHWs, and understanding how well equipped and informed they are will inform strategies to support these key workers¹³. In addition, CHWs are often the most connected with vulnerable communities, who may be at most risk of missing out on public health information, not receiving early and adequate testing and treatment and vaccines, and suffering exacerbations of pre-existing health conditions^{3,4,6}.

Vaccination access and acceptance

In December 2020, when COVID-19 vaccines started to become globally available, this added another layer to the complex landscapes, including new issues related to vaccine access and expanded issues related to vulnerability. In response, we extended the scope of the study to include a component to explore perceptions towards vaccines and vaccine access. Demand for COVID-19 vaccines has far outstripped supply, and countries

around the world are competing for available vaccines^{14,15}. 85% of doses have been administered in high-income and upper-middle-income countries, while only 0.3% have reached low income countries¹⁶. At point of writing, Indonesia had fully immunised 11% of its population, Nepal 13%, and Vietnam only 1.7%¹⁷. Access to COVID-19 vaccines comes on the back of existing general vaccine access challenges, particularly for the most at-risk populations in LMICs. In Nepal, equity gaps in childhood immunisation coverage have narrowed over time, but there are still substantial inequalities, by household wealth, maternal education, ethnic group and region^{18,19}. Indonesia is among 20 countries prioritised by the Global Vaccine Alliance (GAVI), facing severe challenges related to coverage, equity and sustainability of routine immunization²⁰. Vietnam also has considerable inequities in coverage of routine vaccinations, which has led to large outbreaks of vaccine-preventable diseases in recent years^{21,22}. SARS-CoV-2 vaccines requiring strict maintenance of cold chain and refrigeration at very low temperatures may pose additional challenges in LMICs.

Even after overcoming barriers to vaccine access, there is no guarantee that SARS-CoV-2 vaccine would be acceptable to the population. There have been concerns about the speed at which vaccines were licensed and controversies about trial conduct²³. Concerns about side effects and efficacy issues, particularly in relation to new variants, have also emerged²⁴. Generally, rates of SARS-CoV-2 vaccine confidence are higher in LMICs²⁴, but a recent publication of global vaccine confidence found that whilst there were increases in confidence in some countries over time, there was heterogeneity between countries, and recent reports of hesitancy towards childhood vaccines in Vietnam^{25,26}. Since the pandemic began, rumours and misinformation about vaccines have been circulating in a number of settings^{27,28}.

Social media

Knowledge, in many forms, is pushed into the realm of the community through global networks including social media and other digital technologies, transforming COVID-19 into an ‘infodemic’²⁹. The feelings, anxieties, scientific information, misinformation, and rumors (among so much more) are readily available for the public to sift through and incorporate into their knowledge base surrounding COVID-19. These channels also impact the public perceptions of COVID-19 and COVID-19 vaccines, as well as people’s response to it, and as such, form a significant contribution to an understanding of COVID-19 in the study sites.

This manuscript describes a study set in South and Southeast Asia, specifically in Indonesia, Nepal, and Vietnam, to document and explore how the pandemic is affecting individuals and their communities. In this study, we focus on the wider health and economic impacts of COVID-19, in particular emerging and increased burden on mental health, as well as new or deepened vulnerabilities in the communities. We identify health workers as a group uniquely challenged by the pandemic, and we explore how they have been able to respond and how they have been impacted. Public perceptions of the pandemic and public health measures directly affect compliance and uptake of

health interventions, including vaccines. The introduction of vaccines has added another layer of complexity and highlighted differences in acceptance and inequalities around access. This study also includes an exploration of the role of social media in revealing or driving perceptions of the pandemic. Here we outline the study design and methods for a multi-country study aiming to engage with communities across a range of settings that will allow us to compare findings and translate knowledge about factors associated with risk and resilience during the COVID-19 pandemic.

Protocol

Study design

The study is a mixed methods social science study, combining survey methods and social media surveillance to gain a picture of the general situation within each country, with in-depth qualitative methods to gain a deeper understanding of issues faced by specific groups in each country coupled with a synergistic engagement component. Data collection is spread across two Phases. Phase 1 is concerned with exploring lived experiences, impacts on working lives and livelihoods, mental health and coping strategies. Phase 2 is concerned with acceptance of COVID-19 vaccines, factors that increase and reduce acceptance, and factors that influence access. The engagement components are being implemented before, during and after the social science data collection. The engagement was tailored for each site and the findings from the engagement work inform the social science data collection throughout the project. The social science findings also inform the engagement work so that it addresses specific concerns brought up in the surveys and interviews.

Aims and objectives

The aim of Phase 1 of this social science and participatory engagement project is to explore the experiences and impact of COVID-19 on healthcare workers and health-related staff, and vulnerable communities in Vietnam, Nepal, and Indonesia. The aim of Phase 2 is to explore themes around acceptance and accessibility of vaccines. Together, findings from this research will be used to inform guidance on strengthening support for health workers and improving access to public health measures and vaccines for the most vulnerable populations in our settings.

The primary objectives are as follows:

1. Identify and describe the experiences and perceptions of healthcare workers (HCWs), community health workers (CHWs) and other healthcare staff during the COVID-19 pandemic in Nepal, Indonesia, and Vietnam, with emphasis on:
 - a. Roles, human resources, personal protective equipment (PPE) access, support, and coping strategies in the complex healthcare landscapes across the sites;
 - b. Impact of COVID-19 on HCWs’ and health-related staff’s mental health and risk and protective factors;
2. Explore the impact of the COVID-19 outbreak on the lived experiences of vulnerable communities in Nepal, Indonesia, and Vietnam;

- a. Impacts of non-pharmaceutical interventions on livelihoods, behavioural responses, and coping strategies;
 - b. Impact of COVID-19 on mental health and risk and protective factors;
3. Describe disruptions to health services and the impact of COVID-19 on healthcare seeking;
 4. Inform national and global policymakers concerning access and acceptance of COVID-19 vaccines;
 5. Identify mis-information circulating within these populations and co-design targeted evidenced-based public engagement.

Study setting and study populations

We are focusing the research within three countries in South and Southeast Asia that are part of the Wellcome Africa Asia Programme's Oxford University Clinical Research Unit (OUCRU). The Oxford University Clinical Research Units are based in Vietnam, Indonesia and Nepal with the aim of conducting collaborative biomedical, sociological and ethical research to reduce the impact of infectious diseases in these countries and the region, in close partnership with local hosts, institutions and stakeholders. When we started the Phase 1 data collection in September 2020, Vietnam, Indonesia and Nepal had had very different experiences of COVID-19. In Vietnam, there had been relatively few cases and hospitals had not been overburdened, while in Indonesia they had already seen a huge number of cases resulting in increasing pressure on the health care system. In Nepal, there had been a steady increase in the number of cases over the month preceding data collection, although the total number of cases remained relatively low at this point. These experiences have changed over the course of Phase 1 and into Phase 2. However, across these three countries, the experiences and impact of COVID-19 are likely quite different for communities, HCWs, and CHWs. We also selected HCWs and communities across a range of settings in each country. The study population consists of three main groups:

- a. Healthcare workers include physicians, nurses, pharmacists, laboratory scientists, and other health professionals working in a range of sites including local health centres, district level clinics and hospitals, provincial and national hospitals as well as other health related spaces, including COVID-19 care centres.
- b. Health-related staff include other staff within hospitals and health centres (e.g. cleaners, ambulance drivers, office staff), as well as community health workers and community members working with local health authorities to relay health-related information to the community. The community health workers could be formally titled as such or include others who perform similar roles.
- c. Community members from "vulnerable" communities may include those who may be at most risk of missing public health information, poorer access to healthcare (e.g. testing, treatment, vaccination), and those who have

comorbid health conditions. Examples of vulnerable communities may include migrant workers, ethnic populations, elderly populations, people in or discharged from quarantine facilities (including travelers and contacts), recovered COVID-19 patients, people with diabetes and/or hypertension and others, keeping in mind that new definitions of vulnerability may have arisen in the context of COVID-19. Online surveys also include the wider public.

We are conducting the study in 13 districts across the three countries; see [Figure 1](#), which was generated using QGIS version 2.18. We also targeted some specific populations, such as people in quarantine centres, recovered patients, new mothers, TB and Hepatitis C patients, and ethnic minority groups. The characteristics of the study populations in each setting are described in [Table 1](#).

Study procedures

Recruitment. In Phase 1, we target participants in each study setting in order to reach a minimum sample size (see below). Links to online surveys are posted on institutional websites and shared through professional networks and social media channels, including Facebook and institutional websites, in Nepal and Vietnam, to reach as wide an audience as possible. We sought permission to contact discharged COVID-19 patients and people within or discharged from quarantine centres, in the hospital sites managing patients and quarantine centres. These potential participants will be contacted by phone. We are using our extensive networks within the healthcare systems and communities in each country to target specific vulnerable communities to increase participation, identify participants without internet access to take part in telephone interviews, and to recruit participants for in-depth interviews and digital diaries, which are participant-led films that are created based on their personal stories. For targeted healthcare worker interviews, we are randomly sampling participants from staff lists at selected hospitals and health centres linked to our partner institutions, using computer-generated random numbers and stratified by department and sex. For targeted community interviews, we are using randomly sampled participants from household listings obtained from our local community-level partners where possible, as well as purposive sampling to identify participants who represent vulnerable groups and those who would be most likely to be unable to access the online survey.

In Phase 2, we first target participants from the community survey in Phase 1 for whom we have a contact phone number or email address. We then randomly select additional participants from household lists using computer-generated random numbers, in order to reach our minimum sample size for each setting. We will also post links to the survey online to be shared through social media, including Facebook and institutional websites, and professional networks.

We are using purposive sampling to select participants for in-depth interviews based on gender, age and vulnerability, as

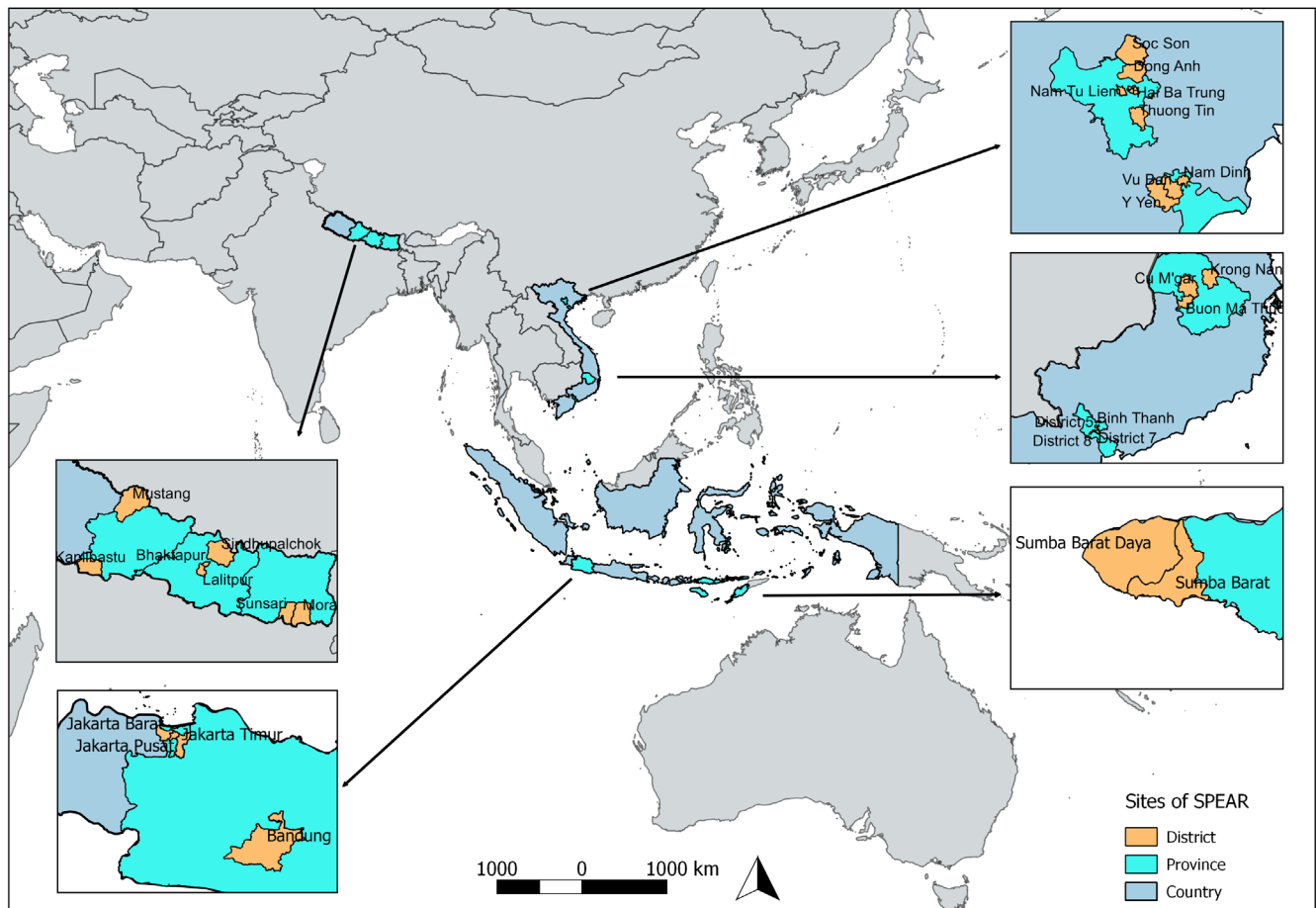


Figure 1. Study locations in Indonesia, Nepal and Vietnam.

well as the categories listed above in the previous section, to obtain a wide range of experiences and perspectives relevant to the study site. Participants for interviews may also be identified through discussions with key stakeholders and through already established contacts in the research sites. We may interview some of the participants more than once (within one phase and/or across both phases). If a participant does not provide consent, they will be excluded from the study.

Sample size. The minimum number of participants for each country in each phase has been estimated at 400 per country per survey (based on the number of targeted interviews that are being conducted by telephone or in person). The maximum sample sizes for the surveys are unknown. We expect that the number of surveys could be four hundred or thousands. This will depend on the success of our dissemination methods for the online survey, and the ability of respondents to access the internet. It is not possible to control for maximum sample size in this study as the data collection is disseminated via the internet.

The minimum number of participants for each survey (HCW and community) in each phase has been estimated at 400 per survey per country for community based on 50% prevalence

and 5% precision and 95% confidence interval for the range of factors considered. This gives the most conservative sample size estimate for prevalence estimates for any indicator, and a minimum of 385 participants per country, rounded up to 400. From a systematic review of studies estimating depression and anxiety among health-workers during COVID-19, 23% of health-workers have experienced either of these. We require a minimum of 273 HCWs per country in order to estimate depression and anxiety at these levels with 5% precision. In Vietnam, all staff at the Hospital for Tropical Diseases (HTD) are being invited to participate. HTD is one of the main COVID-19 treatment hospitals in Ho Chi Minh City, and the hospital management wants to evaluate the situation for its entire staff. Staff at the National Hospital for Tropical Diseases (NHTD) in Hanoi are being sampled separately, with a minimum sample size of 300. The sample will be stratified according to the proportion of doctors, nurses and healthcare-related staff at NHTD, and drawn randomly from the staff list, with probability proportional to size for each stratum. We are also sampling a minimum of 300 health-workers from community sites in Nam Dinh and Dak Lak. This sample will be stratified so that there are 150 in each community site. In Nepal, we are sampling a minimum of 300 staff from Patan Hospital, following a

Table 1. Characteristics of study settings.

Location	Setting	Population	Specific populations included	Context	Healthcare worker targeted	Community participants targeted
Indonesia					400	600
Jakarta	Urban	10.6 million	HCW: Hospitals and primary healthcare Community. Elderly, comorbidities, current and ex-COVID-19 patients, people who lost their job	Capital city, in an urban conglomerate of 30 million people	150	200
Bandung	Urban	2.6 million	HCW: Hospitals and primary healthcare Community. Elderly, comorbidities, current and ex-COVID-19 patients, people who lost their job	Capital of West Java province	150	200
Sumba	Remote	0.7 million	HCW: Hospitals and primary healthcare Community. Elderly, comorbidities, current and ex-COVID-19 patients, people who lost their job	One of the Lesser Sunda Islands, in the province of East Nusa Tenggara. Rural, island economy, in underdeveloped eastern Indonesia	100	200
Nepal					800	600
Morang & Sunsari	Urban/ peri-urban	1.7 million	HCW: General random sample from staff lists (hospital and PHC, community HCW) Community: General random sample	Two districts in eastern Outer Terai (lowland plains)	100	100
Kathmandu (Lalitpur)	Urban	1.4 million	HCW: General random sample from staff lists (tertiary hospital, PHC, community HCW) Community: General random sample	Capital city	300 hospital 55 community HCW	100
Bhaktapur	Urban	0.8 million	HCW: General random sample from staff lists (primary healthcare, PHC and community HCW) Community: General random sample	13km East of Kathmandu	45	100
Sindupalchowk	Rural	0.3 million	HCW: General random sample from staff lists (hospital, PHC and community HCW) Community: General random sample	Hills	100	100
Lower Mustang	Remote	0.01 million	HCW: General random sample from staff lists (hospital, PHC and community HCW) Community: General random sample	High-altitude, mountainous district, second least populated in Nepal	100	100
Kapilvastu	Urban/ peri-urban	0.6 million	HCW: General random sample from staff lists (hospital, PHC and community HCW) Community: General random sample	District in western Terai (lowland plains)	100	100
Vietnam					1100	500
Hanoi	Urban	8 million	HCW: General random sample from staff list (tertiary hospital) Community: Recovered patients, street vendors, factory workers, shop owners, drivers	Capital city, north Vietnam	300	100

Location	Setting	Population	Specific populations included	Context	Healthcare worker targeted	Community participants targeted
Ho Chi Minh City	Urban	9 million	HCW: Entire staff at tertiary hospital, self-selected nurses at COVID-19 care centres Community: Recovered patients, quarantined people, general public	Largest city in Vietnam, south Vietnam	500	100
Nam Dinh	Rural	2.1 million	HCW: General random sample from staff list (provincial, district hospital, PHC, CHW) Community: Quarantined people, recovered patients, farmers, factory workers	Rural province in Red River Delta. Predominantly agricultural, with several industrial zones.	150	150
Dak Lak	Remote	2.1 million	HCW: General random sample from staff list (provincial, district hospital, PHC, CHW) Community: Mothers of children under 5-years attending vaccination clinics	Province in Central Highlands region. Remote communities predominantly ethnic minority groups	150	150

HCW = Healthcare worker; PHC = Primary healthcare centre

similar stratified sampling procedure as for NHTD. In Indonesia, we are recruiting participants from Jakarta, Bandung and Sumba. For the healthcare workers and health related staff, we are sampling from primary health care centres and regional public hospitals. For the community, we will sample from people residing in the areas surrounding the primary health care centres with recommendations from the staff of primary health care centres.

Enrolling a higher number of participants through online surveys in Nepal and Vietnam allows us to perform substantive analysis, and the granularity of analysis (for instance stratification of data by location, groupings is increased in line with increasing sample size.

The sample size estimates for the qualitative components are being determined based on an estimate that would maximize the diversity of the sample (i.e. including enough participants to obtain a range of experiences) while also following the concept of theoretical saturation (i.e. including participants up until the point where no new categories and experiences are being discovered in the interviews for a particular group). The number of interviews required per site/category is likely to be between 6–10³⁰.

Data collection. We are using a mixture of quantitative and qualitative, and participant-led methods to collect general and in-depth insights into the wider impacts of COVID-19 for the populations mentioned above. Specifically, we are conducting online/telephone surveys³¹ and we will use qualitative methods (key informant interviews, in-depth interviews, focus group discussions, digital diaries) to explore themes in more depth. The topics in phase 1 focus on experiences, preventive measures, and impacts on livelihoods and mental health, while in phase 2, the topics include perceptions and challenges related to COVID-19 vaccination. The data collection topics for each method are included in more detail in [Table 2](#). The following data collection tools are included in as Appendices: HCW survey (phase 1), Community surveys (phase 1 and 2), key-informant topic guide (phase 1), focus group discussion guide (phase 1), HCW in-depth interview guide (phase 1) and Community in-depth interview guides (phase 1 and 2). In keeping with the participant-led approach used in the digital diaries, participants will be instructed to reflect on a pertinent, personal experience related to the pandemic. The specific topic for the diaries will be decided by each participant.

It is possible to collect all of the data outlined in this study remotely, without requiring face-to-face interviews. We will consider substituting with face-to-face interviews in accordance with local government requirements for social distancing at each time-point during the study period.

Outcomes

For each objective there are several outcomes, both quantitative and qualitative. The outcomes for each objective are listed in [Table 3](#).

Analysis

Quantitative data management and analysis plan. For participants who fill in the survey online, their responses are routed directly into a REDCap server (available free of charge to non-profit organisations). For participants who complete a phone or interview administered survey, responses are entered into REDCap directly (if the interviewer has access to internet) or documented on paper and then entered into REDCap from the paper form. We will use weights to adjust the sample to reflect the national population structures by age, sex and region. We will use descriptive statistics to describe the range of participants and their responses to individual questions, as well as regression models to identify more vulnerable groups in terms of social and health impacts.

Qualitative data management and analysis plan. All interviews are being audio recorded, transcribed, and translated, as needed. All field notes from key informant discussions are being handwritten and typed within two to three days. The digital diaries are being transcribed in the language spoken and translated to English, as needed. Any identifiers are being removed during the transcription and/or translation process so that all files uploaded for analysis preserve the confidentiality of the participants, as much as possible. We will upload the interview and diary transcripts and fieldnotes into NVivo 12, however, QDA Miner Lite, an alternative free software, could also be used.

We are conducting coding in teams, by country, with full team discussions at regular intervals. The analysis includes at least two cycles of coding. For provisional coding, we are using a mixed inductive and deductive coding framework to start the coding process. We created the initial coding framework by integrating topics of interest, questions of interest from the interview guide, and topics that inform the research questions we are interested in exploring^{32–34}. The coding framework includes topics of interest noted from the debrief sessions, therefore the framework also includes data-driven inductive codes. During provisional coding, we are integrating flexibility as the project is being conducted in multiple sites and therefore we expect that there will be variation between the sites in many of the topics and categories. The second cycle coding techniques are used to broaden the categories and themes from the first cycle coding. The exact technique that we are using will depend on the analysis but we will use often the ‘relevant text’ as a way of reducing the amount of data for each main topic³⁵. This means we will use the relevant codes from first cycle coding within the second cycle coding. We will integrate cross checks to ensure we did not miss anything from the first cycle coding. For the primary analyses, we will use pattern coding³⁴. We will extract the relevant data coded during the first cycle coding and conduct more detailed analysis. Patterns are typically themes, explanations, relationships, or theoretical constructs and it is often useful to illustrate the larger patterns in an illustrative map³⁶. For in-depth topic or cross-country analyses, we may adapt the technique based on the data (e.g. meta-theme analysis for cross-cultural research).

Table 2. Methods and preliminary topics for data collection.

Methods	Estimated sample size	Preliminary data collection topics	Study sites
Objective 1. Experiences of hospital staff, community health workers and related health staff			
Country-wide surveys (online/phone/paper)	Minimum of 400 per country	Risk, stress and anxiety, resilience, social impact, personal protective equipment (PPE) access and practices, public health control measures	Vietnam Nepal Indonesia
Key informant discussions	11-22 informants (1-2/ site, as needed), multiple discussions/informant	General experiences, largely led by participant, also to gain referrals for participants for in-depth interviews	Vietnam: 4 sites Nepal: 5 sites Indonesia: 3 sites
Focus group discussions	N=1-2 discussions with 8-12 people/ discussion	Experiences, concerns, duty of care, moral/personal responsibilities, public health responses & community reaction, ethical considerations	Vietnam: 1 site (only at HTD)
In-depth interviews	N = 120-180 interviews (10-15/site)	Experiences, concerns, duty of care, moral/personal responsibilities, public health responses & community reaction, ethical considerations, practical challenges and perceived health risks related to PPE practices	Vietnam: 4 sites Nepal: 5 sites Indonesia: 3 sites
Digital Diaries	N=60 (20/country)	Experiences, concerns and worries, personal commentary of lived experiences and unfolding situation	Vietnam Nepal Indonesia
Objective 2. Impact of outbreak and response on vulnerable communities			
Country-wide survey (online, phone, paper)	Minimum of 400 per country, per phase	Knowledge and attitudes, experiences, impact of response on daily life, livelihoods and healthcare, anxiety and depression, and coping strategies	Vietnam Nepal Indonesia
In-depth interviews	First phase: N = 110 – 165 interviews (10-15/site) Second Phase: N = 33-55 interviews (3-5/site)	Follow-up topics related to survey findings, community impact of COVID-19 and response, vaccination, and other topics, as needed	Vietnam: 4 sites Nepal: 5 sites Indonesia: 3 sites
Digital diaries	N=60 (20/country)	Experiences, concerns and worries. Daily practices during lockdown and pandemic, personal commentary of lived experiences and unfolding situation	Vietnam Nepal Indonesia
Objective 3. Identifying and responding to misinformation in social media			
Monitoring of social media and mainstream news	N = 18 months	Identifying misinformation about COVID-19 circulating in target populations	Vietnam Nepal Indonesia
Public engagement media	N = 15 (5/country)	Activities and evidence-based media developed in partnership with experts and local policy makers	Vietnam Nepal Indonesia

COVID-19 = coronavirus disease 2019

Media monitoring data collection and coding plan. The media monitoring processes are conducted in the three country sites guided by a search and coding protocol as outlined in [Table 4](#). Specific variables and indicators are used to code all selected news items, including: details of the news platform name, date of publication, the title of the article, a summary of the content, and the link to the article. The news posts will be categorized by content categories: (1) Prevention, (2) Treatment, (3) Disease epidemiology (including prevalence, new incidence, risk factors), (4) Governmental management (including

regulations, governance, etc.); and (5) Related discrimination and xenophobia.

The statements will also be categorized as to whether they are potentially misleading to the public or not. If yes, the number of engagements (share, repost, or comment) will be recorded, to get a representation of the information distribution. In this process, misleading information is defined as any shared information that may cause an incorrect or potentially harmful action or response by the public. This includes:

Table 3. Study objectives and outcomes.

Objective	Outcomes
1. Identify and describe the experiences and perceptions of HCWs, CHWs and other healthcare staff during the COVID-19 pandemic in Nepal, Indonesia, and Vietnam, with emphasis on: <ol style="list-style-type: none"> Roles, human resources, PPE access, support, and coping strategies in the complex healthcare landscapes across the sites; Impact of COVID-19 on HCWs' and health-related staff's mental health and risk and protective factors; 	<p><i>Quantitative</i></p> <p>Proportion of HCWs, CHWs and other healthcare staff:</p> <ul style="list-style-type: none"> - With increased workload - Facing human resource limitations - Facing challenges accessing PPE and medical supplies - Employing coping strategies to manage mental health challenges - Experiencing depression, anxiety and stress <p><i>Qualitative</i></p> <ul style="list-style-type: none"> - Detailed descriptions of main themes and patterns across sites related to the lived experiences of COVID-19 pandemic and the public health response - Descriptions of challenges and solutions faced by healthcare workers and related staff across the sites
2. Explore the impact of the COVID-19 outbreak on the lived experiences of vulnerable communities in Nepal, Indonesia, and Vietnam; <ol style="list-style-type: none"> Impacts of non-pharmaceutical interventions on livelihoods, behavioural responses, and coping strategies; Impact of COVID-19 on mental health and risk and protective factors; 	<p><i>Quantitative</i></p> <p>Proportion of community participants:</p> <ul style="list-style-type: none"> - Complying with public health measures - Employing other prevention measures and coping strategies - With impacts on their livelihoods - Experiencing depression, anxiety and stress <p><i>Qualitative</i></p> <ul style="list-style-type: none"> - Detailed descriptions of main themes and patterns across sites related to the impact of COVID-19 outbreak and the public health response
3. Describe disruptions to health services and the impact of COVID-19 on healthcare seeking;	<p><i>Quantitative</i></p> <ul style="list-style-type: none"> - Proportion of HCWs, CHWs and other healthcare staff reporting disruptions to other medical services - Proportion of community participants reporting disruptions to healthcare and vaccination services <p><i>Qualitative</i></p> <ul style="list-style-type: none"> - Descriptions of healthcare seeking in the context of COVID-19
4. To inform national and global policymakers concerning access and acceptance of COVID-19 vaccines;	<p><i>Quantitative</i></p> <ul style="list-style-type: none"> - Proportion of community participants who say they would accept COVID-19 vaccines - Proportion of community participants who say would have difficulty accessing COVID-19 vaccines <p><i>Qualitative</i></p> <ul style="list-style-type: none"> - Understanding of the factors associated with lower acceptance and access
5. Identify misleading information circulating on social media and in mainstream news media within these populations and co-design targeted evidenced-based public engagement.	<ul style="list-style-type: none"> - Misleading (biased, misinformation or disinformation) news posts identified. - Posts categorized by content: prevention, treatment, disease epidemiology, governmental management and related discrimination and xenophobia. - Public health messaging and public engagement events designed to counter misinformation.

HCW = Healthcare worker; CHW = Community health workers; COVID-19 = coronavirus disease 2019

i. **Bias information:** a particular tendency to express feelings or opinions, especially ones that are preconceived or unreasoned, and/or to interpret information that confirms one's pre-existing beliefs or hypotheses.

ii. **Disinformation:** false information that is publicly announced in the news media with the sharer's intention to mislead and deceive the public for political or social gains.

Table 4. Summary of media monitoring process and coding plan.

Process	Variables recorded	Content categories	Country-specific sources
1. Google search with selected key words; 2. Specified monitoring date range; 3. Recording of data in excel 'log sheets' according to agreed variables and indicators; 4. Statements categorized as to whether misleading the public or not (categorised as: bias, misinformation or disinformation); 5. Engagements with the news item is recorded as number of engagements (share, repost, comment) to gauge information distribution; 6. Verification of any statements related to technical or medical information which may or may not be misleading; 7. Identification of key themes/messages which are misleading or 'fake news'.	-Details of the news platform name; -Date of publication; -Number and date of engagements -Article title; -Content summary; -Article link	-Prevention; -Treatment; -Disease epidemiology (including prevalence, new incidence, risk factors); -Government management (including regulations, restrictions, etc.); -COVID-19 related discrimination and xenophobia.	Indonesia: 3 major news portals, with a focus on government statements; Nepal: 1 major news portal and Facebook sites; Vietnam: 3 top news websites and Facebook sites.

- iii. Misinformation: false or inaccurate information created as a result of an honest mistake and negligence by the sharer.

Identified themes and specific misleading messages are being addressed through positive, evidence-based public health messaging utilizing our existing engagement communication platforms such as institute websites, Facebook groups and online forums.

Ethics and dissemination

Approvals. This study was reviewed and approved by the National Hospital for Tropical Diseases Ethics Committee (Hanoi, Vietnam), Hospital for Tropical Diseases Ethics Committee (Ho Chi Minh City, Vietnam), Ethics Committee of Nepal Health Research Council (Kathmandu, Nepal), Patan Hospital Ethics Committee (Kathmandu, Nepal), Ethics Committee of the Faculty of Medicine, University of Indonesia (Jakarta, Indonesia) and Oxford Tropical Research Ethics Committee (Oxford, UK). In addition, we obtained local government permission as required by the local regulations in each context.

Informed consent. For online surveys, information about the study is provided on the first page, and participants are asked to click a link that states they agree to participate and this will allow access to the survey questions. If participants do not agree to participate, they will not be able to access the survey and proceed. For remote interviews, where possible, we email the participant information sheet and the consent form 1–2 days prior to the interview so that potential participants can review it prior to the interview and ask questions to the researchers or anyone else regarding participation. For those without email, we read the study information and consent sheet over the telephone and audio record their verbal consent to take part. For in-person interviews, we present both written and verbal information from the participant information sheet and collect written consent.

For digital diaries, we obtain written or verbal consent after providing details of the requirement of the activity and discuss possible uses of the media. Participants are also given options to contribute data to the study, but not have their visual media used for wider engagement purposes. Participants are instructed as to the importance of autonomy and consent, and trained to get recorded third party verbal consent from anyone they film, or to take the pictures in a manner that doesn't reveal identity. In Vietnam, verbal consent is not accepted and written third party consent is being obtained from anyone whose image or identity is included. Footage including persons without consent is not being used in final cuts and will be destroyed.

Data storage and availability. All data are being stored on a secure server centrally held at OUCRU. If remote interviews are undertaken, files are uploaded to the server within 1–2 days of the interview and deleted from the original computer. All laptops used for data collection and data storage are encrypted and password protected. Email addresses and phone numbers for future contact and linkage are stored separately from the survey responses, and will only be used for linkage. The linking data will be destroyed after use. We are storing all qualitative data from interviews and fieldnotes separately from documents that could identify the participant. All visual media is submitted from participants' devices (e.g. mobile phones) to the project team film editors. All raw and edited footage will be uploaded and stored on a secure OUCRU server. However, the nature of the media does not easily allow for anonymity. Participants will be encouraged to use pseudonyms if they want to but media from participants who do not consent to being visually identifiable will be destroyed and not included in the digital diary collection.

The anonymous qualitative and quantitative data will be made available from the corresponding author on reasonable request.

Dissemination. We will disseminate findings in multiple ways. First, we will produce short reports and policy briefs for government officials and policy-makers to inform national risk mitigation plans and training and support needs of CHWs, for preparedness related to Covid-19 and future threats. Second, we will publish findings in peer-reviewed journals. Third, we will make an interactive web app so that participants and the public can explore survey results. Digital diaries from consenting participants will be edited into short films and uploaded onto social media sites. Where restrictions allow, the films will be shown to participating communities in facilitated screenings. These will be specific to each country site. A compilation of diaries will be edited into a film documenting the experiences of vulnerable groups and CHWs across sites and used to raise awareness and improve practice. Findings from the media monitoring exercise are fed back to the wider engagement and communications team weekly, informing the focus and design of regular public health messages on social media and through partner institutes and community partners. Finally, we will compile tools used, lessons learned, and reflections from key informants and colleagues implementing the activities in each site, to develop a toolkit of research methods for engaging with vulnerable communities that can be applied on a global scale in this and future health and environment crises.

Conclusions

Developing and delivering research in a pandemic was highly complicated. We planned for the SPEAR study to be implemented at multiple sites across the OUCRU network that had ongoing research. The embedded nature of OUCRU and the long-standing collaborations in the communities made it possible to implement the study across the sites. Despite various challenges, the SPEAR study team is now successfully set up and working across 13 sites, integrating multiple methods of data collection, while also providing regular input from the research-side to inform the SPEAR engagement team and their engagement activities.

Study status

Data collection for SPEAR study Phase 1 started in November 2020 and is completed. Phase 2 data collection started in November 2021 and is estimated to be completed by January 2022. Analysis and dissemination are ongoing and are estimated to be completed by December 2022.

Abbreviations

CHWs: community healthcare workers

HCWs: healthcare workers

HTD: Hospital for Tropical Diseases

NHTD: National Hospital for Tropical Diseases

OUCRU: Oxford University Clinical Research Unit

OxTREC: Oxford Tropical Research Ethics Committee

PHC: Primary healthcare centre

PPE: personal protective equipment

SARS-COV-2: severe acute respiratory syndrome coronavirus 2

SPEAR: social science and public engagement action research

Data availability

Underlying data

No underlying data are associated with this article.

Extended data

Oxford University Research Archive: COVID-19 Social Science and Public Engagement Action Research in Vietnam, Indonesia and Nepal (SPEAR project) data collection tools. <https://doi.org/10.5287/bodleian:rJ00ZmbE³¹>

This project contains the following extended data:

- 07SR_547-20_Phase_1_FGDs_HCW_EN_V1.1_25OCT20.docx (focus group guide)
- SPEAR_Survey_Community_En_v0.10_27_Nov_sent_by_Nepal_update_2.docx (participant questionnaire)
- SPEAR_Survey_Vaccine_v1.5_EN_24_OCT_2021_final.docx (participant questionnaire)
- 07SR_547-20_Phase_1_Key_Informant_topics_EN_V1.0_15JUL20.docx (discussion topics)
- 07SR_547-20_Phase_2_IDI_guide_Vaccines_community_EN_V1.1_21OCT.docx (interview schedule)
- SPEAR_Survey_HCW_English_version_for_Nepal_RED-Cap_set_up_UPDA.docx (HCW questionnaire)
- 07SR_547-20_Phase_1_IDI_guides_HCW-1_EN_V2.0_25NOV20.docx (interview schedule)
- 07SR_547-20_Phase_1_IDI_guides_community_EN_V1.1_20JAN21.docx (interview schedule)

Data are available under the terms of the [Creative Commons Attribution 4.0 International license](https://creativecommons.org/licenses/by/4.0/) (CC-BY 4.0).

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OUCRU Vietnam COVID-19 research group

1. Chambers Mary,
2. Choisy Marc,
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6. Donovan Joseph,
7. Du Hong Duc,
8. Dung Vu Tien Viet,
9. Fisher Jaom,
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11. Geskus Ronald.
12. Hang Vu Thi Kim

13. Ho Quang Chanh
14. Ho Thi Bich Hai,
15. Ho Van Hien,
16. Hung Vu Bao,
17. Huong Dang Thao,
18. Huynh le Anh Huy,
19. Huynh Ngan Ha,
20. Huynh Trung Trieu,
21. Huynh Xuan Yen,
22. Kestelyn Evelyne,
23. Kesteman Thomas,
24. Lam Anh Nguyet,
25. Lawson Katrina,
26. Leigh Jones,
27. Le Kim Thanh,
28. Le Dinh Van Khoa,
29. Le Thanh Hoang Nhat,
30. Le Van Tan,
31. Lewycka Sonia Odette,
32. Lam Minh Yen,
33. Le Nguyen Truc Nhu,
34. Le Thi Hoang Lan,
35. Nam Vinh Nguyen,
36. Ngo Thi Hoa,
37. Nguyen Bao Tran,
38. Nguyen Duc Manh,
39. Nguyen Hoang Yen,
40. Nguyen Le Thao My,
41. Nguyen Minh Nguyet,
42. Nguyen To Anh
43. Nguyen Thanh Ha,
44. Nguyen Than Ha Quyen,
45. Nguyen Thanh Ngoc,
46. Nguyen Thanh Thuy Nhien,
47. Nguyen Thi Han Ny,
48. Nguyen Thi Hong Thuong,
49. Nguyen Thi Hong Yen,
50. Nguyen Thi Huyen Trang,
51. Nguyen Thi Kim Ngoc,
52. Nguyen Thi Kim Tuyen,
53. Nguyen Thi Ngoc Diep,
54. Nguyen Thi Phuong Dung,
55. Nguyen Thi Tam,
56. Nguyen Thi Thu Hong,
57. Nguyen Thu Trang,
58. Nguyen Thuy Thuong Thuong,
59. Nguyen Xuan Truong,
60. Nhung Doan Phuong,
61. Ninh Thi Thanh Van,
62. Ong Phuc Thinh,
63. Pham Ngoc Thanh,
64. Phan Nguyen Quoc Khanh,

65. Phung Ho Thi Kim
66. Phung Khanh Lam,
67. Phung Le Kim Yen
68. Phung Tran Huy Nhat,
69. Rahman Motiur,
70. Thuong Nguyen Thi Huyen,
71. Thwaites Guy,
72. Thwaites Louise,
73. Tran Dong Thai Han,
74. Tran Kim Van Anh,
75. Tran Minh Hien,
76. Tran Phuong Thao,
77. Tran Tan Thanh,
78. Tran Thi Bich Ngoc,
79. Tran Thi Hang,
80. Tran Tinh Hien,
81. Trinh Son Tung,
82. van Doorn H Rogier,
83. Van Nuil Jennifer,
84. Vidaillac Celine Pascale,
85. Vu Thi Ngoc Bich,
86. Vu Thi Ty Hang,
87. Yacoub Sophie.

HTD COVID-19 research group

1. Nguyen Van Vinh Chau,
2. Nguyen Thanh Dung,
3. Le Manh Hung,
4. Huynh Thi Loan,
5. Nguyen Thanh Truong,
6. Nguyen Thanh Phong,
7. Dinh Nguyen Huy Man,
8. Nguyen Van Hao,
9. Duong Bich Thuy,
10. Nghiem My Ngoc,
11. Nguyen Phu Huong Lan,
12. Pham Thi Ngoc Thoa,
13. Tran Nguyen Phuong Thao,
14. Tran Thi Lan Phuong,
15. Le Thi Tam Uyen,
16. Tran Thi Thanh Tam,
17. Bui Thi Ton That,
18. Huynh Kim Nhung,
19. Ngo Tan Tai,
20. Tran Nguyen Hoang Tu,
21. Vo Trong Vuong,
22. Dinh Thi Bich Ty,
23. Le Thi Dung,
24. Thai Lam Uyen,
25. Nguyen Thi My Tien,
26. Ho Thi Thu Thao,
27. Nguyen Ngoc Thao,

28. Huynh Ngoc Thien Vuong,
29. Huynh Trung Trieu,
30. Pham Ngoc Phuong Thao,
31. Phan Minh Phuong,
32. Bui Thi Hong Ngoc.

EOCRU COVID-19 research group

1. Bachtiar, Andy
2. Baird, Kevin J.
3. Dewi, Fitri
4. Dien, Ragil
5. Djaafara, Bimandra A.
6. Elyazar, Iqbal E.
7. Hamers, Raph L.
8. Handayani, Winahyu
9. Kurniawan, Livia Nathania
10. Limato, Ralalicia
11. Natasha, Cindy
12. Nuraeni, Nunung
13. Puspatriani, Khairunisa
14. Rahadjani, Mutia
15. Rimainar, Atika
16. Saraswati
17. Shankar, Anuraj H.
18. Suhendra, Henry
19. Sutrisni, Ida Ayu
20. Suwarti
21. Tarino, Nicolas

22. Timoria, Diana
23. Wulandari, Fitri

(In addition) For the SPEAR group

1. Ragil Dien Soraya Weldina
2. Ramadhan Fahmi

OUCRU-NP COVID-19 research group

1. Basnyat Buddha
2. Duwal Manish
3. Gautum Amit
4. Karkey Abhilasha
5. Kharel Niharika
6. Pandey Aakriti
7. Rijal Samita
8. Shrestha Suchita
9. Thapa Pratibha
10. Udas Summita

SPEAR PARTNERS

1. Dewi Friska
2. Aria Kekalih
3. Claus Bogh
4. Dinesh Deokota
5. Rabi Shakya
6. Pawan Sharma
7. Anup Rajbhandari
8. Pham Ngoc Thach
9. Mai Thi Phuoc Loan

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Phaik Kin Cheah

Faculty of Arts and Social Science, Universiti Tunku Abdul Rahman, Perak, Malaysia

This protocol describes and justifies a study to investigate the experiences and impacts of the Covid-19 pandemic along with the public health measures among healthcare workers and vulnerable communities in 3 countries - Vietnam, Indonesia and Nepal. The research project intends to look into the lived experiences of people in the three countries involving issues related to vaccinations, mental health, health and economic impacts, the social media.

This is a large project in terms of scale and scope. The protocol adequately describes the procedures and processes. Information is well presented, explaining the need for the various methods of data collection. The use of multiple data sources is commendable as this would enable researchers to verify, triangulate and discuss the results more thoroughly and completely. The use of digital diaries as a source of data is resourceful and novel.

1. It would be helpful to publish the interview guide as well. This would better facilitate replication by other researchers.
2. In the **Vaccination access and acceptance** section, it was stated that "85% of doses have been administered in high-income and upper-middle-income countries, while only 0.3% have reached low income countries". Therefore, it needs to be explained which category each of the three countries fall under and how each country's rate of immunisation (i.e. "Indonesia had fully immunised 11% of its population, Nepal 13%, and Vietnam only 1.7%") compares to the global figures and what the implications are.
3. In the **Vaccination access and acceptance** section, it would be helpful to also describe the specific issues faced in Indonesia as those faced in Vietnam and Nepal have been highlighted. It would help readers and other researchers understand the context in relation to vaccination access and acceptance in which this research protocol is being used. (It is noted that some of the general issues faced by each country have also been highlighted in the **Study setting and study populations** section in general.)
4. "We sought permission to contact discharged COVID-19 patients and people within or

discharged from quarantine centres, in the hospital sites managing patients and quarantine centres. These potential participants will be contacted by phone." Please clarify if participants have given consent to be contacted.

Is the rationale for, and objectives of, the study clearly described?

Yes

Is the study design appropriate for the research question?

Partly

Are sufficient details of the methods provided to allow replication by others?

Partly

Are the datasets clearly presented in a useable and accessible format?

Not applicable

Competing Interests: No competing interests were disclosed.

Reviewer Expertise: Public health, Covid-19, qualitative methods

I confirm that I have read this submission and believe that I have an appropriate level of expertise to confirm that it is of an acceptable scientific standard, however I have significant reservations, as outlined above.
