Preparedness and Response Measures to Mitigate the Health and Socioeconomic Impacts of Epidemics on Women, Children and Adolescent: Protocol for a Systematic Review

Draft Authors: Fiona Clement,[1,2] Brenlea Farkas,[1,2] Laura Dowsett,[1,2] Diane Lorenzetti,[1,2,3] Mehr Shah,[4] Ian Graham,[5] Brent Hagel,[1,6] Sharon Straus,[7,8] Andrea Tricco,[8,9,10] Etienne V. Langlois[4]

Affiliations:

1. The Department of Community Health Sciences, University of Calgary, Canada
2. O'Brien Institute for Public Health, University of Calgary, Canada
3. Health Sciences Library, University of Calgary, Canada
4. The Partnership for Maternal, Newborn, and Child Health, World Health Organization, Switzerland
5. Centre for Practice-Changing Research, Ottawa Hospital Research Institute, University of Ottawa, Canada
6. The Department of Paediatrics, University of Calgary, Canada
7. Department of Medicine, University of Toronto, Canada.
8. Li Ka Shing Knowledge Institute, St Michael's Hospital, Toronto, Canada.
9. AT Institute of Health Policy, Management and Evaluation (IHPME), University of Toronto, Toronto, Ontario, Canada
10. Dalla Lana School of Public Health, University of Toronto, Canada

Corresponding Author: Fiona M. Clement
3D10, Teaching Research and Wellness Building
3280 Hospital Drive NW
Calgary Alberta T2N 4N1
Telephone number: 403-210-9373
fclement@ucalgary.ca

Co-Author contact information:
Brenlea Farkas: brenlea.farkas@ucalgary.ca
Laura Dowsett: lelegget@ucalgary.ca
Dr. Diane Lorenzetti: dllorenz@ucalgary.ca
Mehr Shah: shahme@who.int
Dr. Ian Graham: igraha2@uottawa.ca
Dr. Brent Hagel: bhagel@ucalgary.ca
Dr. Sharon Straus: sharon.straus@unityhealth.to
Dr. Andrea Tricco: andrea.tricco@unityhealth.to
Dr. Etienne V. Langlois: langloise@who.int

Contributions: EVL and MS conceptualized the study. The protocol was written by FC, BF, LD, EL, MS and AT, with input provided by DL, IG, BH, and SS. All authors approved of the protocol.

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Abstract

Introduction: The COVID-19 pandemic is a global health crisis with both acute and long-term economic and social impacts. Women, children, and adolescents (WCA) are a population that are disproportionately effected by large-scale health crises. Disruptions to basic health services, social protection, impacts on the economy and changes in the labour force have significant impacts on the health and wellbeing of women, children, and adolescents. The current COVID-19 crisis offers the opportunity to support the strengthening of health system preparedness and response measures, particularly enhancing gender-sensitive mitigation strategies, social protection schemes, economic policy and multisectoral collaboration.

Aim: To synthesize the available evidence on the effectiveness and implementation of preparedness and response measures to mitigate the health and socioeconomic consequences of COVID-19 and previous pandemics and epidemics on WAC through a systematic review.

Methods: A systematic review will be conducted according to the PRISMA Statement 2020. Six databases including Embase, Econlit, APA PsycINFO, SocINDEX, CINAHL and MEDLINE from inception to present day will be searched. The following inclusion criteria will be applied: outcomes measured in populations of women, children, and/or adolescents; intervention aimed at improving the health and well-being of WCA; comparator not required; outcomes related to health, or socioeconomic impacts on WCA (e.g., life expectancy, sexual and reproductive health, mental health, income, or employment); any study design that reports original data; is not a review, commentary, or editorial. Abstract review, full-text review, and data extraction will be conducted by two independent reviewers using standardized forms, with conflicts resolved by consensus. Risk of bias tools specific to assessing the internal validity of the study designs included in the systematic review will be selected (e.g., the Cochrane Risk of Bias Tool version 2.0, Cochrane Effective Practice and Organization of Care Tool, Cochrane ROBINS-I tool, and the JBI Critical Appraisal Checklist for Qualitative Research).

Synthesis: We will present all results related to study, population, intervention and outcome characteristics in tables, data exhibits, and appendices. If meta-analysis is possible, the statistical software R will be used. Subgroup analysis will be conducted by country income, vulnerability and equity considerations (e.g. refugees, poverty) and settings (e.g., humanitarian or fragile setting) if data permits. We will use the GRADEPro Software to interpret findings and create "summary of findings" tables for each outcome for which a meta-analysis was possible.

Discussion: The systematic review results will have a substantial impact on the health and well-being of women, children, and adolescents globally. Our results will be directly used by decision-makers with the Partnership for Maternal, Newborn, and Child Health (PMNCH), World Health Organization and the United Nations to make decisions regarding policy-relevant and equity-enhancing interventions to use for COVID-19, as well as future pandemics.

Introduction

The COVID-19 pandemic is a global health crisis with both acute and long-term economic and social impacts.[1] This global emergency has wreaked havoc on the global economy, with the potential for long-lasting impacts on employment levels and deprivation.[1] Women, children, and adolescents are often disproportionately impacted by health crises due to secondary effects including disruption to health services, social protection, and impacts on the economy and in the labour force. The impact of epidemics on women and girls is exacerbated simply by virtue of their gender.[2] For example, during the 2014-15 Ebola outbreak in Sierra Leone, it is estimated that more mothers and babies died due to disruption in health services, than the total number of people who died from virus itself.[3-5] The current COVID-19 health crisis threatens to push back the limited gains made on gender equality, sexual and reproductive health and rights (SRHR), vulnerability to violence, and women's equal participation in the labour force.[2] For instance, the labour force impacts of COVID-19 has already disproportionately affected women, with lay-offs being focused on sectors where women are often over-represented (e.g., retail, hospitality, and tourism).[2] Recent forecasts also indicate that global poverty is on the rise for the first time since 1998, with an estimated 47 million women and girls being pushed into extreme poverty.[6] This will increase the total number of women and girls living in extreme poverty to 435 million, with projections showing that this number will not revert to pre-pandemic levels until 2030.[6]

Impacts on children and adolescents are also unique. One of the greatest socioeconomic impacts of the pandemic for children and adolescents is the exacerbated learning crisis.[1] Almost 90 percent of the world's students, about 1.5 billion young people, had their education disrupted in 188 countries with imposed school closures.[1] Although more than two-thirds of countries have

distance-learning platforms in place, among low-income countries the coverage is only 30 percent.[7] School closures also contribute to malnutrition, as an expected 368.5 million children miss out on reliable school meals.[1] Similarly, the economic impact of COVID-19 could increase the number of people facing food insecurity to 265 million in 2020, an increase of 130 million from 2019.[8] Furthermore, like disruptions to women's basic health services, children face disruptions to essential health services such as vaccination programs.[9] Evidence from previous pandemics has indicated that alongside an increase in gender-based violence, malnutrition, teenage pregnancy and prevalence of child labour can also increase.[10]

Additionally, the COVID-19 pandemic is occurring in a world without safety nets for many populations. Four billion people today have no access to any form of social protection, including 2 out of every 3 children worldwide .[11] The COVID-19 crisis impacts the world's poorest and most vulnerable hardest, with significant intergenerational implications for poor families. The most vulnerable in the face of this crisis are those who are already at risk: refugees and displaced populations, urban poor, and vulnerable populations lacking access to basic social and political protections or to any support systems, thus exacerbating existing inequities.[12]

Based on emerging evidence on the effects of the COVID-19 pandemic, there is a clear need to consolidate health system strengthening activities and multi-sectoral efforts to improve prevention, preparedness, alertness, and response, with a view of addressing equity gaps and the needs of vulnerable women, children and adolescents. Improved coordination among global health security initiatives is also necessary to efficiently match resources to needs, avoid redundant efforts, reduce waste, and identify gaps. The Partnership for Maternal, Newborn and Child Health (PMNCH) – a partnership hosted by the World Health Organization (WHO), in collaboration with the World Bank and the Global Financing Facility (GFF), has identified a knowledge gap on effective and

appropriate interventions to mitigate the health and socioeconomic impacts of epidemics on women, children and adolescents, including the socioeconomic returns on investments. . Thus, we aim to synthesize the available evidence on the effectiveness and implementation of preparedness and response measures to mitigate the health and socioeconomic consequences of COVID-19, and future pandemics and epidemics, on women, children and adolescents, including the most vulnerable.

Methods

This systematic review protocol was developed using the PRISMA for Protocols (PRISMA-P).[13] This protocol was developed with the team, including researchers and knowledge users from PMNCH/WHO (e.g., Dr. Langlois). This protocol was finalized to include feedback from the team and registered in the PROSPERO[14] database (registration number: CRD42021229527). The Cochrane Handbook[15] will be used to guide the conduct of our systematic review, which will be reported using the PRISMA 2020 Statement.[16] Given the specificity of the language that we are using to describe our work, we include definitions of terms that readers may be unfamiliar with in the appendix.

Research Question

The research question for this project is: what are effective and feasible interventions and strategies for preparedness and response measures to improve the health and well-being of women, children and adolescents during pandemics and epidemics, including, but not limited to, interventions addressing the most vulnerable populations? We will use an integrated knowledge translation (KT)

approach whereby researchers will co-create all steps of the systematic review with the knowledge users, including the Partnership for Maternal, Newborn, and Child Health, WHO (Langlois).

Sex, gender, and intersectionality

All activities will be conducted with a focus on sex and gender using an intersectionality lens, including a sex and gender-based analysis. Intersectionality provides a deeper understanding of inequities by examining how our social identities intersect with social and structural systems of privilege and oppression.[17,18] We will use 4 strategies to ensure sex and gender are considered with an *intersectional lens* (as we acknowledge that the sources of oppression would not be fully examined in the studies) across all activities:

1) Appointing a 'sex and gender champion' (Tricco) who will lead the incorporation of sex and gender considerations, from an intersectionality lens, and provide ongoing support, coaching, and mentorship on sex- and gender-based analysis for the investigative team and their staff;
2) Inviting the investigative team and their staff to complete an exercise in which they reflect on their own lived experience and how this has been an advantage or disadvantage in their lives, focusing on sex and gender and the intersection of factors (e.g., genders, sexual orientations, ages, incomes, ethnocultural backgrounds, Indigenous status, languages spoken, geographic locations), allowing the team to situate themselves in this project and reflect on what biases they may bring to it;
3) Analyzing and reporting sex, gender, and related intersectionality data across all studies included in the systematic review, whenever available, using the 'sex and gender equity in research' (SAGER) guidelines[19] (details in the Data Extraction section); and

4) Classifying included studies with a specific focus on gender equity and intersectionality using the PROGRESS-Plus framework.[20]

Eligibility Criteria

The eligibility criteria are listed in Table 1. Pandemics and epidemics will be defined based on the WHO classification.[21] Interventions will be included if there is a stated purpose of improving the health and well-being of women, children and adolescents, with a policy focus, and including (but not limited to): macro- or micro-economic measures to address socioeconomic challenges, stimulus packages, funding, social and/or financial protection schemes, multisectoral approaches, and health system preparedness (Table 2). All study designs are eligible (e.g., randomized and quasi-randomized trials, non-randomized trials, controlled before-after studies, interrupted time series, cohort/case control/cross-sectional studies, evaluative studies including impact and process evaluations, qualitative studies). All outcomes measuring the health and socioeconomic impacts on women, children and adolescents are relevant and will be considered for inclusion. Health will be defined using the WHO definition, and include outcomes related to "physical, mental, and social well-being"[22] (e.g., quality of life, life expectancy, malnutrition, sexual or reproductive health, infant mortality, or mental health). Socioeconomic impacts will include social or economic factors that influence access to health services, education, employment, income, welfare and protection (e.g., education attainment, employment status, career progression, or access to necessities such as food, water, and shelter).

Table 1. Eligibility Criteria

Inclusion Criteria	Exclusion Criteria
• Population assessed in outcomes: women, children and adolescents (10-19 years) (intervention or strategies may target additional groups) • Intervention: any preparedness and response intervention with a stated purpose of improving the health and mitigating socioeconomic impacts on women, children and adolescents. • Comparator: not required • Outcome: any health and wellbeing measure of women, children and adolescents, including outcomes related to socioeconomic factors associated with health such as employment, income, and education. • Design: any evaluative study design • Context: any study within a pandemic or epidemic situation in any type of context including humanitarian and fragile contexts. Pandemics and epidemics will be defined based on the classification used by the WHO.	• Interventions that do not aim to improve health and wellbeing • Population is not women, children or adolescents. However, the intervention may target other groups while the outcomes are specifically to better the health and well-being of women, children, and adolescents • Editorials, commentaries • Non-primary research • Non-human populations • Contexts other than pandemics and epidemics • Descriptive studies that do not include evaluative outcomes

Table 2. Examples of Interventions of Interest

Possible Interventions	Examples
Micro-economics	Reduced interest rates, tax abatement, access to credit
Macro-economics	Reduction or elimination of tariffs on necessary medical supplies to ensure global access and distribution of vital goods and services
Stimulus package	One-time or multiple payments to the most vulnerable women to provide financial assistance due to job loss, loss of childcare/support, or health benefits
Social or financial protection plan	Plans to protect social support such as child welfare, and human rights; financial plans to assist businesses in retaining workers and providing employment services
Multisectoral approaches	Development and implementation of distance-learning platforms to provide uninterrupted education to children/adolescents learning remotely due to quarantine protocols
Health system preparedness	Procurement of vital medical and safety equipment, medications, and staff; plan to reduce or prevent disruptions to health services specifically impacting WCA

Literature Search

A comprehensive literature search strategy will be developed by an experienced librarian and a second librarian will peer review the strategy using the Peer Review of Electronic Search Strategies (or PRESS) checklist.[23] The following databases will be searched: Embase, Econlit, SocINDEX, APA PsycINFO, CINAHL and MEDLINE from inception to present day. No limitations will be applied to language of dissemination or status of dissemination. Subject headings and keywords (title/abstract words) such as "pandemic" or "epidemic", with be combined using the Boolean Operator "and", with population terms such as "women", "child", "adolescent", and intervention terms such as "public health".

Screening

The literature search results will be screened by applying the eligibility criteria in Table 1. Calibration will be completed by all team members prior to abstract screening through a pilot-test. After >70% agreement is reached, screening of citations will be completed in duplicate by two staff members independently, using a standardized screening form. Conflicts will be resolved through discussion. All abstracts selected for inclusion will proceed to full-text review, and a similar process will be used to calibrate and screen potentially relevant full-text articles. Reference lists of the included studies, as well as from any related systematic reviews will be searched to ensure all relevant literature has been captured.

Grey Literature Search

Unpublished material will be located by searching trial registries (e.g., clinicaltrials.gov), COVID specific databases (e.g., LitCovid, COVID-END) and pre-print servers (e.g., medRxiv, bioRxiv). Resources including policy briefs, technical briefs, and reports from international organizations such as the United Nations (UN), World Health Organization, United Nations Children's Fund (UNICEF), and the World Bank Group will also be located by searching these organizations websites.

Data Extraction

A data extraction form will be developed and pilot-tested by the team. After high agreement (>70%) is reached, two staff members will independently abstract data with conflicts resolved through discussion. Data will be extracted from the included studies using four broad categories; study design characteristics (e.g., year of conduct, geographic location), participant characteristics (e.g., mean age, race, percent gender/sex, setting (e.g., humanitarian setting, fragile setting, country income level)), intervention characteristics (e.g., primary focus: social, economic, health, intervention duration/frequency), and outcome results (e.g., definition of outcome measure, mean change, #participants experiencing outcome). Specifically related to intersectionality, we will use the SAGER guidelines[19] to abstract participant characteristics from the included studies that address aspects of social identity (e.g., sex/gender, socioeconomic status, race, Indigenous status). We will abstract descriptions of how social identities intersect with each other using the definitions provided in the included studies. Studies that specifically focus on gender and intersectionality will be categorized using the PROGRESS-Plus framework[20] (e.g., Place of residence, Race, Occupation, Gender/sex, Religion, Education, Socioeconomic status, Social capital, Plus).

Risk of Bias Appraisal

Risk of bias tools specific to assessing the internal validity of the study designs included in the systematic review will be selected. The Cochrane Risk of Bias Tool version 2.0 will be used for randomized controlled trials[24] and quasi-randomized controlled trials; Cochrane Effective Practice and Organization of Care Tool will be used for non-randomized trials, controlled before after studies and interrupted time series;[25] Cochrane ROBINS-I tool will be used for the cohort, case control, and cross-sectional studies;[26] and the JBI Critical Appraisal Checklist for Qualitative Research will be used for qualitative studies.[27] We will select one included study per study design and pilot-test the risk of bias tools across the entire team. After high agreement is achieved (>70%), two staff members will independently appraise the risk of bias of all included studies.

Synthesis

We will present all results related to study characteristics, participant characteristics, intervention characteristics, and outcome results in tables, figures, and appendices. For each outcome with more than two studies, we will consider a random effects meta-analysis[28] by the category of intervention (e.g., social, economic, health). Different study designs will be analyzed separately. Clinical and methodological heterogeneity will be examined using our insight, whereas statistical heterogeneity will be examined using the I^2 statistic,[29] with values >75% indicating that heterogeneity must be explored via sub-group analysis, sensitivity analysis, or meta-regression. We will include the PROGRESS-Plus variables as additional analyses and risk of bias results. An experienced statistician on the team will conduct all meta-analyses using the R statistical software.[30]

Planned Subgroup analyses

If data permit, subgroup analysis by income of country, setting, and vulnerability/equity will be conducted. Country income will be classified using the World Bank definition of low, lower-middle, upper-middle, high income based on gross national income per capita.[31] Settings of interest include humanitarian settings (e.g., counties or regions actively receiving humanitarian aid), or fragile setting, which is categorized by the World Bank's Fragile, Conflict and Violence group according to the financial and security status of the country or region.[32] Vulnerability/equity considerations will include special populations of WAC such as those living in poverty, refugees, or immigrants. Stratified findings will be presented narratively and in tabular form if meta-analysis is not feasible due to lack of homogenous studies.

GRADE Assessment

We will use the GRADEPro Software to interpret findings and create "summary of findings" tables[33] for each outcome for which a meta-analysis was possible. A pilot-test will be completed including all members of the team for one outcome. After agreement is achieved, two independent staff members will create summary of findings tables, with discrepancies resolved through discussion.

Knowledge Translation Plan

We will use an integrated KT strategy to co-create our systematic review to ensure our results are relevant and useful, as described above. Our end-of-grant KT initiatives will be guided by the Canadian Institutes of Health Research framework,[34] which involves determining the goal of dissemination, tailoring the identified key messages, and using appropriate media for each of the

relevant audiences. The end-of-grant KT will include publishing our systematic review in an open-access, peer reviewed journals (e.g., BMJ), presenting our findings at annual conferences (e.g., Global Evidence Synthesis), developing data visualizations (e.g., infographics or presentations), leading social media campaigns on Twitter and LinkedIn, posting a 1-page knowledge-to-action brief on our websites, sharing our results via our newsletters (targeting >3,000 people) and social media (>2500 Twitter followers), and providing tailored webinars for PMNCH, WHO, WB and GFF.

Discussion

The results of this systematic review will have a global impact on the health and well-being of women, children, and adolescents. Using an integrated KT approach, the results will be directly used by decision-makers within PMNCH, WHO and the UN, informing policy decisions on COVID-19 and guiding preparedness and response plans for future pandemics or epidemics. These results will be used by PMNCH and partners to conduct an in-depth economic analysis and a global investment framework, including modelled costing of effective strategies and interventions to strengthen preparedness and response for WCAH, as well as social and economic returns of these investments.

There are some anticipated limitations of this review. Firstly, given the need for rapid evidence synthesis of COVID-19 related research, a rapid review would be a more efficient study design than a systematic review. However, limiting the search to the past 10 years in a rapid review may exclude informative interventions identified during the SARS-CoV outbreak of 2002-04. A systematic review design ensures comprehensiveness and limits the risk of error since data

extraction is completed by two independent reviewers. Lastly, given the broad scope of interventions, outcomes, and settings of interest, we do not anticipate enough homogenous data to permit meta-analysis.

Acute social and economic impacts have already emerged from the COVID-19 pandemic. The results from this systematic review may aid in alleviating some of these acute impacts, and prevent or mitigate the long-term impacts of COVID-19, and future global health crisis on women, children, and adolescents.

References

1. UN. *UN Shared Responsibility, Global Solidarity: Responding to the socio-economic impacts of COVID-19.* 2020.
2. UN. *Policy Brief: The Impact of COVID-19 on Women.* 2020.
3. Statement on the end of the Ebola outbreak in Sierra Leone [press release]. 2015.
4. Kersti Kaljulaid HC, Jorge Alcocer Varela and Graca Machel. Opinion: Women and children will pay for this pandemic – unless we act. *Thomson Reuters Foundation News*2020.
5. Sochas L, Channon, A.A., Nam, S. Counting indirect crisis-related deaths in the context of a low-resilience health system: the case of maternal and neonatal health during the Ebola epidemic in Sierra Leone. *Health Policy and Planning.* 2017;32(3).
6. UN Women. *From Insights to Action: Gender Equality in the Wake of COVID-19.* 2020.
7. UN. *Policy Brief: Education during COVID-19 and Beyond.* 2020.
8. WFP. COVID-19 will double number of people facing food crises unless swift action is taken. World Food Programme; 2020.
9. UN News. *Millions more children at risk with immunization services disrupted amid COVID 19 pandemic.* 2020.
10. Stenberg K AH, Sheehan P, Anderson I, Gülmezoglu AM, Temmerman M, et al. Advancing social and economic development by investing in women's and children's health: A new Global Investment Framework. *The Lancet.* 2014;383(9925).
11. UNICEF. *UNICEF Social Protection Response to COVID-19: Technical Note.* 2020.
12. UN. *A UN framework for the immediate socio-economic response to COVID-19.* 2020.
13. Shamseer L, Moher D, Clarke M, et al. Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ.* 2015;349:g7647.
14. PROSPERO. https://www.crd.york.ac.uk/prospero/. Accessed December 10 2020.
15. Cochrane Handbook for Systematic Reviews of Interventions. https://training.cochrane.org/cochrane-handbook-systematic-reviews-interventions. Accessed December 10, 2020.
16. Page MJ, McKenzie J, Bossuyt P, et al. The PRISMA 2020 statement: an updated guideline for reporting systematic reviews. 2020; https://osf.io/preprints/metaarxiv/v7gm2/.
17. Christoffersen A. *Intersectional approaches to equality research and data.* Equality Challenge Unit2017.
18. Crenshaw K. Mapping the margins: intersectionality, identity politics, and violence against women of color. *Stan L Rev.* 1990; 43:1241.
19. Heidari S, Babor TF, De Castro P, Tort S, Curno M. Sex and Gender Equity in Research: rationale for the SAGER guidelines and recommended use. *Research Integrity and Peer Review.* 2016;1(1):2.
20. PROGRESS-Plus. https://methods.cochrane.org/equity/projects/evidence-equity/progress-plus. Accessed December 10, 2020.
21. Emergencies. https://www.who.int/emergencies/diseases/en/. Accessed December 10, 2020.
22. World Health Organization. WHO Constitution. 2021.

23. McGowan J, Sampson M, Salzwedel DM, Cogo E, Foerster V, Lefebvre C. PRESS Peer Review of Electronic Search Strategies: 2015 Guideline Statement. *Journal of clinical epidemiology.* 2016;75:40-46.
24. Risk of Bias 2 (RoB 2) tool. https://methods.cochrane.org/risk-bias-2. Accessed December 10, 2020.
25. *Suggested risk of bias criteria for EPOC reviews.* Cochrane Effective Practice and Organisation of Care 2017.
26. ROBINS-I tool. https://methods.cochrane.org/methods-cochrane/robins-i-tool. Accessed December 10, 2020.
27. Joanna Briggs Institute. *Critical Appraisal Checklist for Qualitative Research.* 2017.
28. DerSimonian R, Laird N. Meta-analysis in clinical trials. *Controlled clinical trials.* 1986;7(3):177-188.
29. Higgins JP, Thompson SG. Quantifying heterogeneity in a meta-analysis. *Statistics in medicine.* 2002;21(11):1539-1558.
30. Balduzzi S, Rücker G, Schwarzer G. How to perform a meta-analysis with R: a practical tutorial. *Evidence Based Mental Health.* 2019;22(4):153.
31. The World Bank Group. World Bank Country and Lending Groups. 2021; https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups. Accessed 5 January 2021.
32. World Health Organization. Fragile and Conflict-Affected States Health and WHO. Geneva, Switzerland: Department of Country Cooperation and

Collaboration with the United Nations System; 2017.
33. Schünemann HJ. Interpreting GRADE's levels of certainty or quality of the evidence: GRADE for statisticians, considering review information size or less emphasis on imprecision?. . *J Clin Epidemiol.* 2016;75:6-15.
34. Guide to Knowledge Translation Planning at CIHR: Integrated and End-of-Grant Approaches. 2015; https://cihr-irsc.gc.ca/e/45321.html. Accessed December 10, 2020.
35. World Health Organization. Humanitarian Health Action. 2021; https://www.who.int/hac/about/definitions/en/. Accessed 6 January 2021.
36. The World Bank Group. Classification of Fragile and Conflict-Affected Situations. 2020; https://www.worldbank.org/en/topic/fragilityconflictviolence/brief/harmonized-list-of-fragile-situations. Accessed 7 January 2021.
37. Canadian Institutes of Health Research. What is gender? What is sex? 2020; https://cihr-irsc.gc.ca/e/48642.html. Accessed 6 January 2021.
38. Kruk ME, Myers, M., Tornorlah Varpilah, S., Dahn, B.T. What is a resilient health system? Lessons learned from Ebola *The Lancet.* 2015;385(9980).
39. World Health Organization. Bulletin of the World Health Organization. 2021; https://www.who.int/bulletin/volumes/89/7/11-088815/en/#:~:text=A%20pandemic%20is%20defined%20as,are%20not%20considered%20pandemics. Accessed 6 January 2021.
40. United Nations Office for the Coordination of Humanitarian Affairs. What is preparedness? https://www.humanitarianresponse.info/en/coordination/preparedness/what-preparedness#:~:text=The%20term%20'preparedness'%20refers%20to,current%20hazards%2C%20events%20or%20conditions. Accessed 14 January 2021.

41. WHO. *2019 Novel Coronavirus: Strategic Preparedness and Response Plan.* Geneva, Switzerland: WHO;2020.

Appendix

Definitions of Key Terms
Country income levels: Using the World Bank Atlas method, classification by income is based on their gross national income (GNI), per capita (in USD).[31] • Low-income economies: GNI per capita of $1,035 or less • Low-middle income economies: GNI per capita between $1,036 and $4,045 • Upper-middle income economies: GNI per capita between $4,046 and $12,535 • High income economies: GNI per capita above $12,536
Epidemic: The occurrence in a community or region of cases of an illness, specific health-related behaviour, or other health-related events clearly in excess of normal expectancy.[35]
Fragile setting[a]: Fragile and conflict-affected states (FCS) are a group of countries or territories which are categorized by the World Bank's Fragile, Conflict and Violence group according to their financial and security status.[32] The list distinguishes between countries based on the nature and severity of issues they face. The classification uses the following categories:[36] • Countries with high levels of institutional and social fragility, identified based on publicly available indicators that measure the quality of policy and institutions and manifestations of fragility. • Countries affected by violent conflict, identified based on a threshold number of conflict-related deaths relative to the population. This category includes two sub-categories based on the intensity of violence: countries in high-intensity conflict and countries in medium-intensity conflict.
Gender: The socially constructed roles, behaviours, expressions and identities of girls, women, boys, men, and gender diverse people.[37]
Health: A state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.[22]
Health system resilience: The capacity of health actors, institutions, and populations to prepare for and effectively respond to crises; maintain core functions when a crisis hits; and, being informed by lessons learned during the crisis, reorganize if conditions require it.[38]
Humanitarian setting[a]: A setting that requires national or international resources or help including direct assistance, indirect assistance, or infrastructure support.[35]
Pandemic: An epidemic occurring worldwide, or over a very wide area, crossing international boundaries and usually affecting a large number of people.[39]
Preparedness and Response: The ability of governments, professional response organizations, communities and individuals to anticipate and respond effectively to the impact of likely, imminent or current hazards, events, or conditions; putting in place mechanisms which will allow national authorities and relief organizations to be aware of risks and deploy staff and resources quickly once a crisis strikes.[40] A **preparedness and response plan** outlines the measures that are in place and ready to action in response to a crisis, such as COVID-19.[41] This can include procurement of essential medical supplies/equipment/personnel, plans to reduce/eliminate transmission, and safeguards to protect vulnerable populations such as women, children and adolescents.
Sex: A set of biological attributes in humans and animals. It is primarily association with physical and physiological features including chromosomes, gene expression, hormone levels and function, and reproductive/sexual anatomy.[37]
Socioeconomic impact: Social or economic factors that influence access to health services, education, employment, income, welfare and protection

Footnote:
[a]Fragile and humanitarian settings are not mutually exclusive. Fragile settings may include countries that are also considered humanitarian settings.