



# BMJ Open Evidence of integrated health service delivery during COVID-19 in low and lower-middle-income countries: protocol for a scoping review

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## ABSTRACT

**Introduction** The importance of integrated, people-centred health systems has been recognised as a central component of Universal Health Coverage. Integration has also been highlighted as a critical element for building resilient health systems that can withstand the shock of health emergencies. However, there is a dearth of research and systematic synthesis of evidence on the synergistic relationship between integrated health services and pandemic preparedness, response, and recovery in low-income and lower-middle-income countries (LMICs). Thus, the authors are organising a scoping review aiming to explore the application of integrated health service delivery approaches during the emerging COVID-19 pandemic in LMICs.

**Methods and analysis** This scoping review adheres to the six steps for scoping reviews from Arksey and O'Malley. Peer-reviewed scientific literature will be systematically assembled using a standardised and replicable search strategy from seven electronic databases, including PubMed, Embase, Scopus, Web of Science, CINAHL Plus, and the WHO's Global Research Database on COVID-19 and LitCovid. Initially, the title and abstract of the collected literature, published in English from December 2019 to June 2020, will be screened for inclusion which will be followed by a full-text review by two independent reviewers. Data will be charted using a data extraction form and reported in narrative format with accompanying data matrix.

**Ethics and dissemination** No ethical approval is required for the review. The study will be conducted from June 2020 to May 2021. Results from this scoping review will provide a snapshot of the evidence currently being generated related to integrated health service delivery in response to the COVID-19 pandemic in LMICs. The findings will be developed into reports and a peer-reviewed article and will assist policy-makers in making pragmatic and evidence-based decisions for current and future pandemic responses.

## INTRODUCTION

Sprouting from a local outbreak in Wuhan, China, COVID-19 has emerged as one of the most significant pandemics of the last century.<sup>1 2</sup> Within the last year, over

## Strengths and limitations of this study

- The scoping review aims to uncover new evidence in response to the evolving COVID-19 pandemic and will not assess the quality of existing evidence.
- The review will map a rapidly emerging evidence base in response to COVID-19 from seven different electronic databases that can be used to inform response and recovery strategies in low-income and lower-middle-income countries (LMICs).
- Considering the trajectory of the pandemic, we expect the early published evidence on the COVID-19 pandemic to be focused in high-income and upper-middle-income countries and for evidence from LMICs to be scarce; future reviews should consider the later phases of the pandemic response in LMICs.
- The scoping review is limited to peer-review publications that were originally written in English or have translated versions, and therefore may have missed relevant publications in other languages.

101 million confirmed COVID-19 cases have been detected worldwide with over 2.2 million deaths as of 1 February 2021.<sup>3</sup>

This unprecedented pandemic has put an enormous amount of financial, administrative and logistical stress on the health sector, including the health systems of low-income and lower-middle-income countries (LMICs).<sup>4-7</sup> Historically, health systems in LMICs were structured and sustained as vertical and disease-focused and continue to operate similarly. We acknowledge that significant successes were achieved. However, this fragmentation could create challenges to coordinated pandemic preparedness, response and recovery effort against COVID-19.<sup>8-10</sup> Consequently, the COVID-19 pandemic is imposing a disruptive effect on the progress of movement towards Universal Health Coverage (UHC) through disruptions to essential service coverage and furthering constraints on public financing.<sup>8 11 12</sup>

**Table 1** Dimensions of integrated health service delivery systems

Dimension of integration	Description of the dimensions
Organisational	Integration of organisational units, whether formally through a merger/acquisition, informally through collaboration and referral, or financially by a single purchaser or payor. Organisational integration can be vertical (across levels of care) or horizontal (within levels of care)
Functional	Integration of clinical and non-clinical functions
Service	Integration of different services within a single care team or organisational unit
Clinical	Integration of standardised clinical processes, guidelines, and/or protocols used within/across providers

Source: Lewis *et al.*<sup>19</sup>

Bolstered by an adopted resolution of the 69th World Health Assembly,<sup>13</sup> the 40th anniversary of the Alma Ata Declaration, and the movement towards UHC, there is increasing interest from global health actors to move away from vertical, disease-focused approaches towards people-centred, integrated health service delivery (IHSD) approaches.<sup>14–17</sup> The WHO Regional Office for Europe defined the IHSD system as:

An approach to strengthen people-centered health systems through the promotion of the comprehensive delivery of quality services across the life-course, designed according to the multidimensional needs of the population and the individual and delivered by a coordinated multidisciplinary team of providers working across settings and levels of care... .. with feedback loops to continuously improve performance and to tackle upstream causes of ill health and to promote well-being through intersectoral and multisectoral actions.<sup>18</sup>

While representing these attributes, an IHSD system can present four distinctive dimensions: organisational, functional, service and clinical,<sup>19</sup> which are defined in table 1.

### Integrated health service delivery for pandemic preparedness, response, and recovery

It is possible that interventions to strengthen health service delivery to prepare and respond to a health emergency could relate to, or even advance, broader movements towards an IHSD system. International Health Regulations (IHR) governing health emergencies requires national health systems that are equipped to detect, prepare, and respond during emergencies,<sup>20–21</sup> and recent literature on how to strengthen IHR capacities relates to the overall strengthening of national health systems and leveraging synergies with UHC policies.<sup>21–24</sup> Relatedly, research on building a resilient health system emphasises a coordinated and integrated approach to health emergencies,<sup>25</sup> evidence-based decision making, knowledge integration

in health systems, and the capacity to handle multiple dynamics at once.<sup>26</sup> A 2018 systematic review on defining and nurturing resilience highlighted that integration can improve the coordination, organisation, effectiveness, and efficiency of the system, and it emphasised organisational resilience through coordinated information flows across levels of the health system.<sup>27</sup> Finally, a coordinated approach—including comprehensive risk management, multidisciplinary health sector collaboration, and building community resilience—was recommended for health emergency management during pandemic influenza,<sup>28</sup> suggesting the utility of IHSD during health emergencies such as the COVID-19 pandemic.

The interdependency between the IHSD system and pandemic preparedness is especially pertinent in LMICs. As COVID-19 incidence increases in LMICs, the pandemic has drawn attention towards the required integration of a range of health services and supply chains that are often under-resourced, such as surgical care, mental health services, and oxygen provision.<sup>29–31</sup> Integrated, community-based care approaches have also been emphasised to ensure continued health services for people living with non-communicable diseases who are at increased risk of COVID-19.<sup>32</sup>

### RATIONALE OF THE REVIEW

Successful strategies for pandemic preparedness, response, and recovery could relate to, or be strengthened by, IHSD systems, but this explicit linkage appears under-addressed by existing literature.

Scientific research related to COVID-19 is emerging as rapidly as the pace of the pandemic itself.<sup>33</sup> Moreover, there is an acute lack of exploration of the published evidence focusing on applying IHSD in LMICs. Thus, a scoping review is an appropriate design to map existing literature, summarise it, and identify gaps within a policy and practice context.<sup>34–35</sup>

Exploring IHSD within the context of the initial phase of the COVID-19 pandemic provides a unique opportunity to examine whether LMICs are using integrated approaches in response to an external shock to their health system, what

**Table 2** Databases and their website addresses which were included in the scoping review

No	Database name	Website link
1	PubMed	ncbi.nlm.nih.gov/pubmed/
2	Embase	embase.com
3	Scopus	scopus.org
4	Web of science	webofknowledge.com
5	CINAHL Plus	https://health.ebsco.com/products/cinahl-plus
6	LitCovid	https://www.ncbi.nlm.nih.gov/research/coronavirus/
7	WHO COVID-19 literature database	https://search.bvsalud.org/global-literature-on-novel-coronavirus-2019-ncov/

**Table 3** PubMed literature search script for the scoping review

Search theme	Search script for PubMed
Integrated care	(Delivery of HealthCare, Integrated[mesh] OR Integrat*[tw] OR Integrat* Care[tw] OR Integrat*Health Care[tw] OR Integrat* Healthcare[tw] OR Integrat* Health CareSystem*[tw] OR Integrat* Healthcare System*[tw] OR Integrat* Care Model*[tw] OR Integrat* Delivery System*[tw] OR Integrat* Service Delivery[tw] OR Integrat*Service Delivery System*[tw] OR Integrat* Health Service*[tw] OR Integrat*Health Service* Delivery[tw] OR Integrat* Health Care Polic*[tw] OR Integrat*Healthcare Polic*[tw] OR Integrat* Health Care Organisation*[tw] OR Integrat*Healthcare Organisation*[tw] OR Integrat* model* of health care[tw] OR Integrat* model* of healthcare[tw] OR Health System* Integrat*[tw] OR Integrat*of Health Care System*[tw] OR Integrat* of Healthcare System*[tw] OR Integrat*of Health System*[tw] OR Integrat* of Health System*[tw] OR Service*integrat*[tw] OR System* Integrat*[tw] OR Continuity of Patient Care*[mesh] ORHealthcare Continuum[tw] OR Health Care Continuum[tw] OR Care Continuum[tw] ORContinuum of Care[tw] OR Continuum of Healthcare[tw] OR Continuum of HealthCare[tw] OR Case Management*[mesh] OR Care, Patient-Centered[mesh] OR PatientCentered Care[mesh] OR Patient-Centered Care*[mesh] OR Patient-FocusedCare[mesh] OR Care, Patient-Focused[mesh] OR Patient Focused Care[mesh] ORCoordinat*[tw] OR Coordinat* Care[tw] OR Coordinat* Health Care[tw] ORCoordinat* Healthcare[tw] OR Seamless Care[tw] OR Comprehensive Health Care[tw]OR Comprehensive Healthcare[tw] OR Collaborat*[tw] OR Collaboration between[tw]OR Interface*[tw] OR Case Manage*[tw] OR Case-management[tw] OR CaseManagement[tw] OR Patient-Centered Care*[tw] OR Patient Centered Care*[tw] ORPatient-Focused Care*[tw] OR Patient Focused Care*[tw] OR People-centred Care*[tw]OR People Centred Care*[tw] OR People-centred health system*[tw] OR PeopleCentred health system*[tw] OR People-centered Care*[tw] OR People CenteredCare*[tw] OR People-centered health system*[tw] OR People Centered healthsystem*[tw]) AND
Pandemic preparedness	((Pandemics[MeSH] ORPandemic*[all] OR Epidemic[MeSH] or Epidemic*[all] OR Disease Outbreaks[MeSH]OR “disease outbreaks”[all] OR “disease outbreak”[all] OR (“disease”[all] AND (“outbreaks”[all]OR “outbreak”[all])) AND (Preparedness, Emergency[Mesh] OR EmergencyPreparedness[Mesh] OR “Emergency Preparedness”[all] OR Planning, Disaster[Mesh]OR “Disaster Relief Planning”[all] OR “Disaster Relief”[all] OR Public HealthSurveillance[Mesh] OR “Public Health Surveillance”[all] OR Surveillance[all] OR“Pandemic preparedness”[all] OR “pandemic planning and response”[all] ORpreparedness[all] OR response[all] OR planning*[all] OR management[all] ORprevention[all] OR “humanitarian crises”[all])) AND
COVID-19	(“2019 novelcoronavirus disease”[tw] OR “COVID19”[tw] OR “COVID-19 pandemic”[tw] OR “SARS-CoV-2”[tw]OR “SARS-CoV-2 infection”[tw] OR “COVID19 virus”[tw] OR “COVID-19 virus”[tw] OR“COVID-19 virus disease”[tw] OR “COVID-19 virus infection”[tw] OR “COVID-19”[tw]OR “COVID19”[tw] OR “2019 novel coronavirusinfection”[tw] OR “2019-nCoV infection”[tw] OR “coronavirus disease 2019 “[tw]OR “coronavirus disease-19”[tw] OR “2019-nCoV”[tw] OR “2019-nCoV disease” OR “Wuhancoronavirus”[tw] OR “Wuhan seafood market pneumonia virus”[tw] OR “SARS2”[tw]) AND
LMICs	(To conserve space the search script for LMIC is provided as online supplemental material) AND
Time frame	(“2019/12/01”[PDat] : “2020/04/22”[PDat])

The World Bank developed the list of low-income economies and the lower-middle-income economies according to the World Bank Atlas method using Gross National Income (GNI) per capita. (<https://datahelpdesk.worldbank.org/knowledgebase/articles/378832-what-is-the-world-bank-atlas-method>).

Low-income economies=GNI per capita US\$1035 or less in 2019.

Lower-middle-income economies=GNI per capita between US\$1036 and US\$4045 in 2019.

LMICs, low-income and lower-middle income countries.

approach(es) are being used, and what recommendations are emerging. The review will also identify any emerging evidence on where integrated care has improved health systems or people-centred outcomes during COVID-19 in LMIC settings, and provide guidance on the adoption of various IHSD dimensions. The expected outcomes of the review are the identification of opportunities and implementation challenges during different phases of the pandemic, synthesising potential recommendations for policy-makers and practitioners in LMICs, and supporting pragmatic and evidence-based decisions for current and future pandemic response.

## OBJECTIVES

This study aims to explore the evidence and application of IHSD during the early phase of the COVID-19 pandemic in LMICs using a scoping review methodology. This scoping review has three objectives:

1. Investigating the characteristics of the IHSD system commonly appearing in the COVID-19 literature generated from LMICs in the initial phase of the pandemic.

2. Exploring the dimensions and operational approaches of IHSD being used during COVID-19 preparedness, response, and recovery within the health systems of LMICs.
3. Identifying emerging recommendations on the IHSD system for pandemic preparedness, response, and recovery during the COVID-19 pandemic from LMICs.

## METHODS AND ANALYSIS

The methodology for this scoping review follows Arksey and O’Malley’s six stages for scoping reviews<sup>34</sup> and adheres to the checklist of Preferred Reporting Items for Systematic Reviews and Meta-Analyses’ Extension for Scoping Reviews.<sup>36 37</sup> An overview of each stage of the review follows.

### Stage 1: conceptualising research question

The overarching research question leading this scoping review is: How are the health systems of LMICs using integrated health service delivery approaches to prepare for and respond to the COVID-19 pandemic? This

**Table 4** Inclusion and exclusion criteria for the study selection process of the scoping review

Theme	Inclusion criteria	Exclusion criteria
Subject	Integrated health service delivery for pandemic preparedness, response, and/or recovery for or during COVID-19	Article lacking discussion on integrated health service delivery during or related to COVID-19 (Eg, A study may report case reports on COVID-19, and in the discussion, they recommended integrated health service delivery as a possible way forward. However, the article did not provide any specification or design of an integrated health service delivery model itself. This will be excluded during the selection process)
Evidence characteristics	<ul style="list-style-type: none"> <li>▶ Original research</li> <li>▶ Case studies or case reports</li> <li>▶ Expert consensus</li> <li>▶ Correspondence, commentary, opinion or editorials</li> <li>▶ Systematic, scoping or rapid review</li> <li>▶ Research letter</li> </ul>	<ul style="list-style-type: none"> <li>▶ Conference proceedings and posters</li> <li>▶ Author's reply</li> <li>▶ Research highlight</li> <li>▶ News or media watch</li> </ul>
Country	Low-income countries and lower-middle-income countries	Countries from the upper-middle-, and high-income categories
Time frame	1 December 2019–12 June 2020	
Reporting characteristics	Complete articles that have been published	Article not published in English or without English translation

The World Bank developed the list of low-income economies and the lower-middle-income economies according to the World Bank Atlas method using GNI per capita. (<https://datahelpdesk.worldbank.org/knowledgebase/articles/378832-what-is-the-world-bank-atlas-method>).

Low-income economies = GNI per capita US\$1035 or less in 2019.

Lower-middle-income economies = GNI per capita between US\$1036 and US\$ in 2019.

research question aligns itself with the research objectives mentioned in the above section.

### Stage 2: identification of relevant literature

Followed by the development of the research objectives, a comprehensive and replicable literature search strategy is being structured to extract the references of the relevant peer-reviewed articles from literature repositories (table 2). To implement this process, the research team has first identified key literature from PubMed and Google Scholar to select keywords and index terms and develop the search terms. Next, the study will conduct a comprehensive search across seven electronic databases using the keywords and search terms.

The search strategy of the electronic database consists of four concepts: (1) Integrated care, (2) pandemic preparedness, (3) COVID-19 and (4) names of the countries that belong to the low-income and lower-middle-income groups according to the World Bank Classification.<sup>38</sup> Using these concepts, the initial search strategy developed for PubMed generated only 15 records published between 1 December 2019 and 22 April 2020 (search conducted on 22 April 2020). The proposed search strategy is presented in table 3 and detailed in online supplemental file 1.

As the literature on COVID-19 is rapidly changing, a brief title and abstract scan was conducted to review the performance of the search strategy. On this brief review, the research team concluded that few articles were published from LMICs until 22 April 2020. Thus, a decision was taken to conduct a second round of literature search on 12 June 2020. The second implementation of the search strategy in PubMed generated 92 records,

published between 1 December 2019 and 12 June 2020 (search conducted on 12 June 2020).

After implementing the search strategy in all seven databases, the title and abstracts will be downloaded, and citations will be imported into Covidence systematic review software (covidence.org). At this stage, we will remove the duplicates and organise the search records to review their titles and abstracts.

### Stage 3: study selection

All input articles will be screened during the third stage using the predetermined inclusion and exclusion criteria found in table 4. In line with Arksey and O'Malley's methodological framework for scoping reviews, the inclusion and exclusion criteria represent a broad view of the subject, and the evidence characteristics may be satisfied by a range of study designs and methodologies.<sup>34</sup>

Two independent reviewers will screen the title and abstract of each imported document against the table 4 criteria, and any conflicting recommendations will be reviewed and adjudicated by a third reviewer for consistency. Next, the full text of the initially selected articles will be screened using the same criteria by two independent reviewers, followed by review and adjudication of conflicting recommendations by the third reviewer. As scoping reviews are often iterative,<sup>34</sup> any suggested modifications to the inclusion or exclusion criteria will be reviewed by the entire research team with the senior member making final decisions regarding necessary modifications. If changes to the criteria are agreed on, all previously excluded documents will be rescreened to ensure appropriate inclusion or exclusion against the modified criteria.



**Table 5** Data extraction template

Data extraction themes	Data elements that will be extracted from each eligible article	
Study characteristics	<ul style="list-style-type: none"> <li>▶ Database</li> <li>▶ Title</li> <li>▶ Authors</li> <li>▶ Year</li> <li>▶ Type of article</li> <li>▶ Country name(s) or global focus</li> </ul>	<ul style="list-style-type: none"> <li>▶ Country type (World Bank classification)</li> <li>▶ WHO region</li> <li>▶ Study populations</li> <li>▶ Study location</li> <li>▶ Study design and methodology</li> <li>▶ Framework used (if any)</li> </ul>
Dimensions of Integrated Care and Pandemic Preparedness	<ul style="list-style-type: none"> <li>▶ Definition of IHSD</li> <li>▶ Pandemic phase when IHSD implemented</li> <li>▶ IHSD related risk assessment (preparedness, response and recovery)</li> <li>▶ Typologies of integration</li> <li>▶ Type(s) of service(s) integrated (if applicable)</li> </ul>	<ul style="list-style-type: none"> <li>▶ Integration mechanism (if applicable)</li> <li>▶ Integration structure (if applicable)</li> <li>▶ Integration intensity (if applicable)</li> <li>▶ Incentives for integration (if applicable)</li> <li>▶ Timing of integration (if applicable)</li> <li>▶ Organisational and operational components of integration</li> </ul>
Intersection with COVID-19	<ul style="list-style-type: none"> <li>▶ Provided details on COVID-19 pandemic specific to a country (if applicable)</li> <li>▶ Facilitators of integration</li> <li>▶ Barriers to integration</li> <li>▶ Positive effects of integration</li> </ul>	<ul style="list-style-type: none"> <li>▶ Negative consequences of integration</li> <li>▶ Recommendations—COVID-19 specific</li> <li>▶ Recommendations—health system (non-COVID-19 specific)</li> </ul>

The World Bank developed the list of low-income economies and the lower-middle-income economies according to the World Bank Atlas method using GNI per capita. (<https://datahelpdesk.worldbank.org/knowledgebase/articles/378832-what-is-the-world-bank-atlas-method>)  
 Low-income economies=GNI per capita US\$1035 or less in 2019.  
 Lower-middle-income economies=GNI per capita between US\$1036 and US\$4045 in 2019.

#### Stage 4: charting data

Eligible articles from the full-text review will be re-examined, and the relevant data from the articles will be charted using a data extraction form. Studies will be categorised by the phase(s) of pandemic preparedness addressed in the article (interpandemic, alert, pandemic and transition<sup>28</sup>), and the dimensions of integration present (per the definitions in [table 1](#)). Additional descriptive information on the structures, mechanisms, intensity, and incentives for integration will be identified if applicable. [Table 5](#) provides an overview of the initial overview of data elements, which will be extracted for the study (see online supplemental file 2 for the full extraction form and overview of terms).

#### Stage 5: reporting the results

Charted information will be analysed thematically and reported in a narrative format using tables and figures. Per standardised methodology for scoping reviews, the quality of evidence will not be assessed during the reporting process.<sup>34</sup> Data displays and matrixes will be used to explore aspects of integration vis a vis the risk assessment phases of pandemic response. Dedoose (dedoose.com) will be used to explore clusters of findings geographically and across phases of pandemic response.

#### Stage 6: expert consultation

Expert consultation is an optional stage proposed by Arksey and O'Malley.<sup>34</sup> We believe that there is an inherent value of the expert consultation to translate the findings of this scoping review. Though we intend to perform a brief expert consultation, implementation of this stage will be based on the feasibility and progression of the scoping review.

The potential roster of experts can be developed from the Department of International Health of Johns

Hopkins Bloomberg School of Public Health, Johns Hopkins Center for Health Security and Deutsche Gesellschaft für Internationale Zusammenarbeit. As the findings of this review are designed to support the COVID-19 response in LMICs, we will prioritise inclusion of a diverse set of experts from LMICs who can advise both on the technical design and practical implementation aspects of IHSD in their respective contexts. Experts will reflect a diversity of regional and country perspectives.

#### TIMELINE

Stages 1 and 2 of this review were initiated from April 2020 and iterated until June 2020. Stage 3—title and abstract screening and full-text review—will be conducted from July to November 2020. Stages 4–6 are expected to be completed by March 2021. The estimated completion timeline of the scoping review is May 2021.

#### Patient and public involvement

No patients or members of the public were involved or consulted in developing the study or its intended execution.

#### ETHICS AND DISSEMINATION

Ethical review is not required for the scoping review. Only publicly available secondary data will be used for the review, and no primary data will be collected. A report and a peer-reviewed publication will be developed for broader dissemination of synthesised evidence of the scoping review. There may be additional opportunities to disseminate the findings at conferences or webinars to support the COVID-19 response in LMICs.

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**Contributors** RN, MZH and SG developed the review's objectives; MZH developed the search strategy and conducted the search; RN developed the manuscript under the supervision of SG and with contribution from MZH, PD, VV, NJ and DA. All authors contributed to manuscript revision and read and approved the protocol for publication.

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**Evidence of integrated health service delivery during COVID-19 in low- and middle-income countries:  
protocol for a scoping review**

***Supplemental Material***



**Supplement 1: PubMed literature search script for low and low-middle-income countries**

Search Theme	Search Script for PubMed
Low and middle-income countries	((Deprived Countries[tw] OR Deprived Population[tw] OR Deprived Populations[tw] OR Developing Countries[tw] OR Developing Country[tw] OR Developing Economies[tw] OR Developing Economy[tw] OR Developing Nation[tw] OR Developing Nations[tw] OR Developing Population[tw] OR Developing Populations[tw] OR Developing World[tw] OR LAMI Countries[tw] OR LAMI Country[tw] OR Less Developed Countries[tw] OR Less Developed Country[tw] OR Less Developed Economies [tw] OR Less Developed Nation[tw] OR Less Developed Nations[tw] OR Less Developed World[tw] OR Lesser Developed Countries[tw] OR Lesser Developed Nations[tw] OR LMIC[tw] OR LMICS[tw] OR Low GDP[tw] OR Low GNP[tw] OR Low Gross Domestic[tw] OR Low Gross National[tw] OR Low Income Countries[tw] OR Low Income Country[tw] OR Low Income Economies [tw] OR Low Income Economy[tw] OR Low Income Nations[tw] OR Low Income Population[tw] OR Low Income Populations[tw] OR Lower GDP[tw] OR lower gross domestic[tw] OR Lower Income Countries[tw] OR Lower Income Country[tw] OR Lower Income Nations[tw] OR Lower Income Population[tw] OR Lower Income Populations[tw] OR Middle Income Countries[tw] OR Middle Income Country[tw] OR Middle Income Economies [tw] OR Middle Income Nation[tw] OR Middle Income Nations[tw] OR Middle Income Population[tw] OR Middle Income Populations[tw] OR Poor Countries[tw] OR Poor Country[tw] OR Poor Economies [tw] OR Poor Economy[tw] OR Poor Nation[tw] OR Poor Nations[tw] OR Poor Population[tw] OR Poor Populations[tw] OR poor world[tw] OR Poorer Countries[tw] OR Poorer Economies [tw] OR Poorer Economy[tw] OR Poorer Nations[tw] OR Poorer Population[tw] OR Poorer Populations[tw] OR Third World[tw] OR Transitional Countries[tw] OR Transitional Country[tw] OR Transitional Economies[tw] OR Transitional Economy[tw] OR Under Developed Countries[tw] OR Under Developed Country[tw] OR under developed nations[tw] OR Under Developed World[tw] OR Under Served Population[tw] OR Under Served Populations[tw] OR Underdeveloped Countries[tw] OR Underdeveloped Country[tw] OR underdeveloped economies[tw] OR underdeveloped nations[tw] OR underdeveloped population[tw] OR Underdeveloped World[tw] OR Underserved Countries[tw] OR Underserved Nations[tw] OR Underserved Population[tw] OR Underserved Populations[tw] OR (Afghanistan[tw] OR Angola[tw] OR Bangladesh[tw] OR Benin[tw] OR Bhutan[tw] OR Bolivia[tw] OR Burma[tw] OR “Burkina Faso”[tw] OR Burundi[tw] OR “Cabo Verde”[tw] OR “Cape verde”[tw] OR Cambodia[tw] OR Cameroon[tw] OR “Central African Republic”[tw] OR Chad[tw] OR Comoros[tw] OR Comores[tw] OR Comoro[tw] OR Congo[tw] OR “Côte d'Ivoire”[tw] OR Djibouti[tw] OR Egypt[tw] OR “El Salvador”[tw] OR Eritrea[tw] OR Ethiopia[tw] OR Gambia[tw] OR Gaza[tw] OR Ghana[tw] OR Guinea[tw] OR “Guinea Bissau”[tw] OR Haiti[tw] OR Honduras[tw] OR India[tw] OR Indonesia[tw] OR Kenya[tw] OR Kiribati[tw] OR Kyrgyz[tw] OR Kirghizia[tw] OR Kirghiz[tw] OR Kirgizstan[tw] OR Kyrgyzstan[tw] OR “Lao PDR”[tw] OR Laos[tw] OR Lesotho[tw] OR Liberia[tw] OR Madagascar[tw] OR Malawi[tw] OR Mali[tw] OR Mauritania[tw] OR Micronesia[tw] OR Moldova[tw] OR Mongolia[tw] OR Morocco[tw] OR Mozambique[tw] OR Myanmar[tw] OR Nepal[tw] OR Nicaragua[tw] OR Niger[tw] OR Nigeria [tw] OR Pakistan [tw] OR Palau[tw] OR Panama[tw] OR “Papua New Guinea”[tw] OR Philippines[tw] OR Phillippines[tw] OR Philipines[tw] OR Phillipines[tw] OR Principe[tw] OR Rwanda[tw] OR Ruanda[tw] OR

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“Sao Tome”[tw] OR Senegal[tw] OR “Sierra Leone”[tw] OR “Solomon Islands”[tw] OR Somalia[tw] OR “South Sudan”[tw] OR Sudan[tw] OR Swaziland[tw] OR Syria[tw] OR “Syrian Arab Republic”[tw] OR Tajikistan[tw] OR Tadjhikistan[tw] OR Tadjikistan[tw] OR Tadzhih[tw] OR Tanzania[tw] OR Timor[tw] OR Togo[tw] OR Tunisia[tw] OR Uganda[tw] OR Ukraine[tw] OR Uzbek[tw] OR Uzbekistan[tw] OR Vanuatu[tw] OR Vietnam[tw] OR “West Bank”[tw] OR Yemen[tw] OR Zambia[tw] OR Zimbabwe[tw]))

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*Note: The World Bank developed the list of low-income economies and the lower-middle-income economies according to the World Bank Atlas method using GNI per capita.*

*(<https://datahelpdesk.worldbank.org/knowledgebase/articles/378832-what-is-the-world-bank-atlas-method>)*

*Low-income economies = GNI per capita \$1,025 or less in 2018*

*Lower middle-income economies = GNI per capita between \$1,026 and \$3,995 in 2018*

**Supplement 2: Description of the data extraction form**

<b>Extracted data</b>	<b>Description of the data needs to be extracted</b>
<b><i>Study characteristics</i></b>	
Article Number	Assigned number of the article
Database ID	ID in the repository or database
Article	Article type
Source	Name of the repository or database
Title	Title of the articles
Authors	Author of the article/report/document
Year	Year of publication
Country name	Name of the country/countries where the study/studies were conducted or the integration mechanisms were described or where there is stated relevance of the recommendations
Country Type	<ul style="list-style-type: none"> <li>• Low-income economies: GDP \$1,025 or less (n = 31)</li> <li>• Lower-middle income economies: GDP \$1,026 to \$3,995 (n = 47)</li> </ul>
WHO region	<ul style="list-style-type: none"> <li>• African Region</li> <li>• Region of the Americas</li> <li>• South-East Asia Region</li> <li>• European Region</li> <li>• Eastern Mediterranean Region, and</li> <li>• Western Pacific Region</li> </ul>
Study populations	If applicable
Study location	Urban or Rural
Study design and methodology	<ul style="list-style-type: none"> <li>• Observational studies (qualitative, quantitative, mixed-method, case studies)</li> <li>• Intervention or experimental studies</li> <li>• Methodological report</li> <li>• Systemic review or scoping review</li> <li>• Commentary, editorial or personal narrative or review</li> <li>• Government document or programmatic document</li> <li>• Personal communication</li> </ul>
Study framework(s) and/or theories	If applicable
<b><i>Dimensions of Integrated Care and Pandemic Preparedness</i></b>	
Definition of integrated care	<ul style="list-style-type: none"> <li>• How integrated health service delivery is defined (if directly mentioned in the article)</li> </ul>
Pandemic phase when IHSD implemented	<ul style="list-style-type: none"> <li>• Interpandemic</li> <li>• Alert</li> <li>• Pandemic</li> <li>• Transition</li> </ul>
• IHSD related risk assessment	<ul style="list-style-type: none"> <li>• Preparedness</li> <li>• Response</li> <li>• Recovery</li> </ul>

<b>Extracted data</b>	<b>Description of the data needs to be extracted</b>
Typologies of integration	<ul style="list-style-type: none"> <li>Organizational: Integration of organizations are brought together formally by mergers or through 'collectives' the virtually through coordinated provider networks or via contacts between separate organizations brokered by the purchaser</li> <li>Functional: Integration of non-clinical support and back-office functions, such as electronic patient records</li> <li>Service: Integration of different clinical services at an organizational level, such as through teams of multidisciplinary professionals</li> <li>Clinical: Integration of care delivered by professional and providers to patients into a single or coherent process within and/or across professions, such as through the use of shared guidelines and protocols</li> <li>Mixed: Combination of two or more type above: Specify</li> </ul>
Type of service integration (if applicable)	<ul style="list-style-type: none"> <li>Specific service name / disease focus OR</li> <li>None</li> </ul>
Mechanism of integration (if applicable)	<ul style="list-style-type: none"> <li>Normative: based on shared values for coordination and collaboration</li> <li>Systematic: coherence of rules and policies at various levels of the Organisation</li> </ul>
Structure of integration (if applicable)	<ul style="list-style-type: none"> <li>Horizontal: integration occurring across operating units and/or organizations that are at the same stage in the process of delivering services come together</li> <li>Vertical: brings together organizations at different levels of the hierarchical structure under one management umbrella</li> </ul>
Intensity of integration (if applicable)	<ul style="list-style-type: none"> <li>Full integration: Process of integrating different component of the health system using a new organizational model</li> <li>Partial integration: Process of creating non-binding linkages or ties support integration between health system to improve coordination between them</li> </ul>
Incentives for integration (if applicable)	<ul style="list-style-type: none"> <li>Any monetary or non-monetary incentives for integration targeted at any actors in the health system</li> </ul>
Timing of integration (if applicable)	<ul style="list-style-type: none"> <li>Prior to COVID-19's emergence</li> <li>In preparation for COVID-19</li> <li>During COVID-19</li> <li>After COVID-19 cases had declined in the study area</li> </ul>
Organizational and operational components	<ul style="list-style-type: none"> <li>Program design</li> <li>Policy options used</li> <li>Level/s of health systems integrated</li> <li>Implementation strategy</li> </ul>
<b><i>Intersection with COVID-19</i></b>	
Provided details on COVID-19 pandemic specific to a country (if applicable)	<ul style="list-style-type: none"> <li>Dates of pandemic in specified country</li> <li>Reported cases (absolute number and per capita)</li> <li>Reported deaths</li> <li>Details on health systems capacity during COVID-19 (e.g. beds occupied)</li> </ul>
Facilitators of integration	<ul style="list-style-type: none"> <li>Reported facilitators</li> </ul>
Barriers of integration	<ul style="list-style-type: none"> <li>Reported barriers or challenges</li> </ul>



<b>Extracted data</b>	<b>Description of the data needs to be extracted</b>
'Positive' effects of integration	<ul style="list-style-type: none"> <li>• Can be reported as improvements in inputs, processes, outputs, or outcomes.</li> <li>• Both quantified and qualitative effects should be recorded</li> </ul>
Negative consequences of integration	<ul style="list-style-type: none"> <li>• Can be reported as negative impacts on inputs, processes, outputs, or outcomes</li> <li>• Both quantified and qualitative effects should be recorded</li> </ul>
Recommendations – COVID-19 specific	<ul style="list-style-type: none"> <li>• Preparedness recommendations</li> <li>• Response recommendations</li> <li>• Recovery recommendations</li> </ul>
Recommendations – health system (non-COVID-19 specific)	<ul style="list-style-type: none"> <li>• Related to future pandemics/epidemics</li> <li>• Related to essential services during pandemics/epidemics</li> <li>• Related to the health system when there is not an active pandemic/epidemic</li> </ul>