Guidance for conducting a country COVID-19 after action review (AAR)

31 August 2023

World Health Organization

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Abbreviations

AAR	after action review
COVID-19	coronavirus disease
IAR	intra-action review
IHR	International Health Regulations
IMST	incident management support team
PHEIC	public health emergency of international concern
SARS-CoV-2	severe acute respiratory syndrome coronavirus 2
WHO	World Health Organization

Chapter 1

Introduction

The coronavirus disease (COVID-19) crisis is one of the biggest public health challenges the world has faced in a century and it is considered a "persistent and dangerous health threat" *(1)*. Accordingly, on 30 January 2020, it was classified as a public health emergency of international concern (PHEIC) under the International Health Regulations (2005) (IHR) by the WHO Director-General, based on advice from the IHR Emergency Committee.

As it became clear that the COVID-19 pandemic would be a protracted emergency, WHO published the *Guidance for conducting a country COVID–19 intra–action review* (IAR) in 2020 to help countries periodically review their responses to the pandemic *(2)*. That Guidance was supplemented with an addendum in 2021 *(3)*, as WHO strove to continually adapt and improve its guidance and tools to meet the needs of the rapidly evolving COVID-19 situation.

As of 21st August 2023, the results of 152 IARs have been reported to WHO from 83 countries in all six WHO regions, with 49 IARs undertaken in 2020, 69 in 2021, 27 in 2022 and 7 in 2023, all of which used the WHO IAR methodology in part or in whole to identify areas for immediate remediation and to ensure sustained improvement in the ongoing response to the COVID–19 pandemic.

On 5 May 2023, the WHO Director-General transmitted the Report of the Fifteenth Meeting of the IHR Emergency Committee regarding the COVID-19 pandemic. The Committee had determined that COVID-19 had become an "established and ongoing health issue which no longer [constituted] a public health emergency of international concern" *(4)*.

Following the end of the PHEIC, the first temporary recommendation issued by the Director-General urged state parties to consider how to improve their country's readiness for future pandemics. Specifically, the Report recommended that states "should update respiratory pathogen pandemic preparedness plans [by] incorporating learnings from national and subnational after action reviews" (AARs) *(4)*.

Following the Emergency Committee's determination and subsequent recommendations, WHO has developed this Guidance for conducting

a COVID-19 AAR. This Guidance is developed from and builds on work published before and during the COVID-19 pandemic.

Between 2020 and 2023, the declaration of the PHEIC was a valuable instrument to support the global response to the COVID–19 pandemic, with the Committee's determination encouraging state parties to move towards the long-term management of infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) *(4)*.

The COVID-19 PHEIC encouraged state parties to strengthen their functional capacities, mainly in emergency coordination, collaborative surveillance, clinical care and risk communications and communication engagement *(4)*. As this Guidance suggests, these and other core capacities should be the focus of a COVID-19 AAR.

The temporary recommendation that references AARs, and may prompt states to conduct a COVID-19 AAR, is in line with the IHR (2005) monitoring and evaluation framework *(5)*, which recommends that countries should ideally conduct an AAR as soon as possible (or within three months) after an event or outbreak is declared over by the Ministry of Health or the authorised entity.

In 2019 WHO published guidance about conducting AARs *(6)*; however, the unique nature of the COVID-19 pandemic necessitates that we build on our previous work to develop guidance tailored to the needs and challenges linked to the evolving nature of the COVID–19 situation. A COVID–19 AAR offers a unique opportunity for countries to reflect on the overall management of their pandemic response, identify strengths and shortcomings in their systems and processes, learn from their experience and apply these lessons to create a more robust yet agile and resilient public health emergency preparedness and response system at the local, subnational, national and global levels. It will also help accelerate progress on the path to health systems integration and strengthening, foster emergent opportunities, support more significant equity in health systems, devise strategies to build back better and sustain the capacities developed for health emergency management moving forward.

The post-emergency recovery phase should include mechanisms to capture lessons from AARs and other review processes to strengthen resilience and preparedness through continual learning, adaptation and improvement. Completing a COVID-19 AAR and successfully implementing the recommendations will help accelerate WHO's 10 proposals to build a safer world by strengthening preparedness for health emergencies, as well as responses to them and the resilience of the global public health architecture *(7)*. Similarly, AARs will support countries as they transition to the long-term management of COVID-19, in keeping with WHO's strategic preparedness and response plan for 2023–2025 *(8, 9)*.

This COVID-19 AAR guidance aligns with WHO's policies on preventing and addressing sexual misconduct *(10)*, and ensuring gender equity and human rights. This Guidance advises using specific trigger questions about preventing and responding to sexual exploitation, abuse and harassment and responding to vulnerable and marginalized populations based on the topics

covered by these policies, for example, by mainstreaming the prevention of sexual exploitation and abuse and reviewing national health programmes to ensure that no one is left behind. However, the COVID-19 AAR is a country-led activity, so the scope of the review depends on the country and its context.

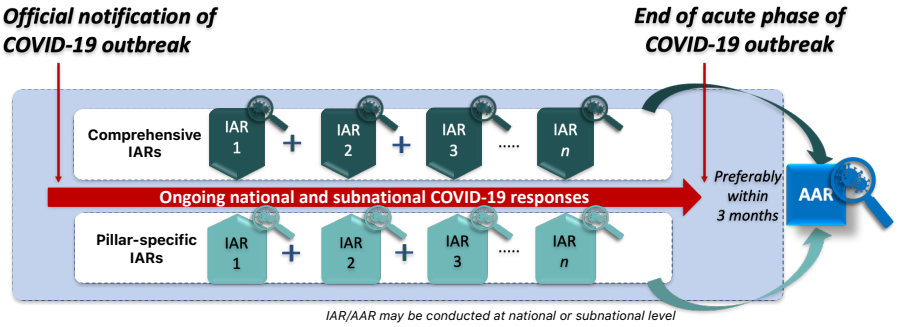
Chapter 2

Complementarity between intra-action and after action reviews

Many countries have already conducted at least one COVID-19 IAR between waves of the pandemic or after specific critical phases of their responses to it. As recommended by WHO, countries have taken ownership of the IAR process and adapted it, conducting comprehensive reviews of their responses at the national and subnational levels, and focusing on specific aspects of one or several public health response pillars. Such reviews have allowed countries to retrospectively track and reflect on their response so far, to identify and implement a manageable number of targeted activities that address the gaps in their response, as well as to focus on aspects of the response that are more time-sensitive (e.g. introducing COVID-19 vaccines to different priority population groups, adjusting public health and social measures as the epidemiological situation changes). In addition to helping countries make these timely improvements to managing the COVID-19 response, IARs have helped identify strengths and gaps in responses across systemic and structural levels.

The COVID-19 pandemic is still evolving, and some countries have transitioned from an approach of managing an acute emergency response to fully integrating COVID-19 management into routine national programmes for public health surveillance and control. As a result, after the acute emergency phase, countries have the opportunity to take stock of recommendations from their COVID-19 IAR or other reviews, for those that conducted them, and determine what has been addressed and properly established, to confirm what remains to be addressed and to identify additional lessons learned to ensure adequate preparedness and response to future public health events and emergencies. All of these steps can be taken by conducting an AAR using the comprehensive approach described in this Guidance. If a country conducted an IAR during its pandemic response, the COVID-19 AAR should build on its findings (Fig. 1).

Fig. 1. Complementarity between intra-action reviews and after action reviews



AAR: after action review; COVID-19: coronavirus disease; IAR: intra-action review.
An AAR is an opportunity to consolidate the lessons learned from any IARs, undertake a more in-depth analysis of what worked and did not work, identify root causes, and formulate practical recommendations to improve preparedness for and responses to future public health emergencies. However, completing an IAR is not a prerequisite to undertaking an AAR. The methodology described in this Guidance can be used in various contexts (e.g. national, subnational) and in situations in which several, one or no IARs have been completed.

Similarly, this Guidance does not replace the 2019 guidance on AARs or the tools used for AARs or IARs (Box 1) *(2, 3, 6, 11, 12)*. Instead, it complements them and builds on past experiences of planning and conducting AARs of complex and protracted public health events. Therefore, this AAR guidance document should be used specifically and uniquely for AARs addressing COVID-19. For reviews of all other emergencies, the 2019 guidance on AARs and tools for AARs and IARs remain current; however, the new pillars may be included if applicable and desired by the implementing countries when conducting a review specifically focusing on the response to the COVID-19 pandemic (Chapter 4).

Box 1. World Health Organization guidance about after action reviews and COVID-19 intra-action reviews

After action review guidance

- *Country implementation guidance: after action reviews and simulation exercises under the International Health Regulations 2005 monitoring and evaluation framework* (2018) *(11)*
- *The global practice of after-action review: a systematic review of literature* (2019) *(12)*
- *Guidance for after action review* (2019) *(6) and tools*

Intra-action review guidance

- *Guidance for conducting a country COVID-19 intra-action review* (2020) *(2)* and 12 templates and tools (2021)
- Addendum 1 to *Guidance for conducting a country COVID-19 intra-action review*, with updated and additional tools (2021) *(3)*

Chapter 3

Purpose of a country COVID-19 after action review

A COVID-19 AAR is a qualitative review of actions taken in response to the COVID-19 outbreak. This Guidance provides advice to countries about how to conduct such a review and introduces new tools and updates to existing tools that are based on the current global COVID–19 situation and feedback received from countries that have successfully conducted IARs (Annex 1). The COVID-19 AAR will identify and document best practices during, challenges to and lessons learned from the response to the event. In addition, the COVID-19 AAR seeks to identify actions that need to be implemented immediately to ensure better preparation for future public health events, including pandemics, and the short-, medium- and long-term actions required to establish and strengthen the necessary capabilities in the health sector and beyond.

Chapter 4

Scope of a country COVID-19 after action review

Traditional AARs vary in scope and format. However, due to the scale and unprecedented nature of the COVID-19 pandemic, it is strongly recommended that countries conduct a comprehensive AAR that allows for:

1. a structured review of the pillars of interest in assessing the public health response within their COVID-19 strategic preparedness and response plan, in addition to other relevant pillars, depending on the context (Table 1);
2. an exchange of ideas, personal perceptions and an in-depth analysis of what happened;
3. identification of what can be done in the short-, medium- and long-term to improve responses to future events.

A COVID-19 AAR focuses on collective learning and experience-sharing. It emphasizes stakeholders' knowledge, focusing on turning tacit knowledge (i.e. knowledge gained through lived experience) into learning, while building participants' trust and confidence.

The scope of the AAR may align with WHO's COVID–19 Strategic Preparedness and Response Plan *(8)* and its operational planning guideline *(9)*, which is structured around 10 response pillars (Table 1). Fourteen of the pillars for COVID-19 AARs are based on the COVID-19 IAR guidance published in 2021, while another five pillars were added based on feedback received during the analysis of the COVID–19 IARs. However, countries can and should adjust the list of pillars to be reviewed according to their own strategy and country-specific needs and contexts.

Given that AARs, like the IARs, are a country-owned and country-led process, it is at the discretion of countries to determine the scope of their COVID-19 AAR. Based on their preferences and desired areas of focus, they may choose to use all pillars, a selection of pillars or a single pillar at the national or subnational levels.

Table 1. Public health response pillars that may be assessed during country COVID-19 after action reviews

1	Country-level coordination, planning and monitoring
2	Risk communication, community engagement and infodemic management
3	Surveillance, case investigation and contact tracing
4	Border Health and points of entry
5	National laboratory systems
6	Infection prevention and control
7	Case management and knowledge-sharing about innovations and the latest research
8	Operational support and logistics for managing supply chains and ensuring workforce resilience
9	Strengthening essential health services during the COVID-19 outbreak
10	COVID-19 vaccinations
11	Considering vulnerable and marginalized populations
12	National legislation and financing
13	Public health and social measures
14	Mental health and psychosocial support (**new**)
15	Urban preparedness and response (**new**)
16	Mass gatherings (**new**)
17	Health system recovery and resilience (**new**)
18	Preventing and responding to sexual exploitation, abuse and harassment (**new**)
19	Other possible topics and cross-cutting issues to be determined by the country's context

Chapter 5

When should a country COVID-19 after action review be conducted?

As some countries officially declare the end of the COVID-19 pandemic and the disease becomes endemic, they need to identify when they may wish to conduct a COVID-19 AAR. These time points could be based on:

- the national context, such as the declaration of the end of a COVID-19 state of emergency by the Ministry of Health or another authorized entity;
- the international context, such as the declaration of the end of the PHEIC on 5 May 2023 by the WHO Director–General *(4)*.

However, the time frame may need to be aligned with the emergency management framework adopted for COVID-19 at the country level and it may need to be based on the local context.

While countries may be at different stages of the epidemiological and control transition regarding the COVID–19 outbreak, the determination by the WHO Director-General to terminate PHEIC status or the declaration of the end of the COVID-19 state of emergency by a competent national authority may suffice as an indicator of when to initiate planning for and conducting of a COVID-19 after action review.

Chapter 6

Considerations for planning a country COVID-19 after action review

The success of an AAR hinges on the ability to harness the perspectives of all relevant stakeholders and to critically and systematically analyse actions taken during the response, as well as to identify crucial areas for improvement.

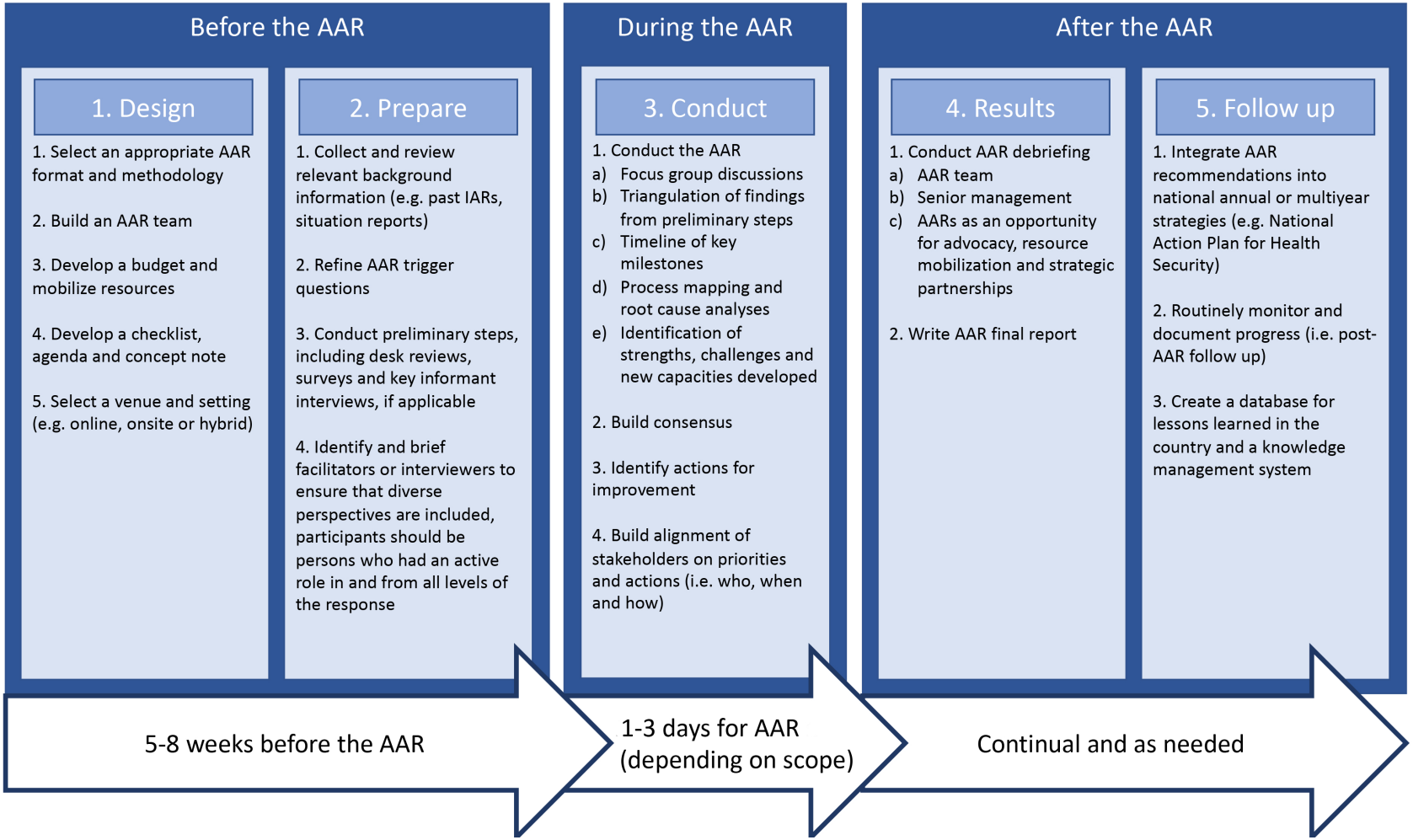
A variety of opinions is vital to the success and pertinence of the AAR; ensuring these opinions are included can be achieved by inviting a wide range of stakeholders to participate who represent all public health response pillars. Importantly, participants must have first-hand experience with and in-depth knowledge about the different levels of responsibility for the pillar being reviewed to assess the country's COVID-19 response. In addition, countries should consider using online options and a comprehensive approach to maximize the number of stakeholders participating if there are geographical, budgetary or time constraints.

A country COVID-19 AAR should take a whole–of–society approach, acknowledging all relevant stakeholders' contributions and important roles. The approach described in this Guidance may help to achieve this.

When planning a COVID-19 AAR, countries should identify potential funding sources for the AAR and to finance the implementation of high-impact easy-to-implement recommendations that may emerge. These funding sources should be actively involved in conducting the AAR to encourage their buy-in and ownership of findings. In addition, countries are encouraged to engage with partners that have had a long-term presence in the country to facilitate the implementation of recommended activities after the AAR.

Fig. 2 provides advice about elements to consider when planning a COVID-19 AAR; additional information can be found in the guidance published in 2019 *(6)*.

Fig. 2. Planning a country COVID-19 after action review



AAR: after action review; IAR: intra-action review.

Chapter 7

Methodology of the country COVID-19 after action review

The COVID-19 AAR methodology builds upon WHO's guidance for AARs and for conducting country-level COVID-19 IARs (Annex 2) *(2, 6)*. WHO's AAR Guidance recommends using a mixed-methods approach because it offers a broad scope for assessing complex and protracted emergencies. Based on this, four phases are recommended for the COVID-19 AAR that countries can adapt to their own context. Countries may perform any of the four phases individually or combine several of them; however, countries are encouraged to use one of the four methods for conducting an AAR detailed in the 2019 Guidance (Annex 2) *(6)*.

The four phases that countries may consider using are:

1. a desk review of peer-reviewed articles, grey literature and operational documents that address lessons learned, such as situation reports, mission reports, meeting reports and COVID-19 IARs;
2. an online survey targeting those who responded to the COVID-19 outbreaks;
3. key informant interviews with stakeholders who are essential to COVID-19 preparedness and responses;
4. focus group discussions with all stakeholders and facilitators.

The first three phases can be conducted concurrently and then followed by focus group discussions. All data collected from the different phases should be triangulated for each public health response pillar being reviewed.

7.1 Desk review

A preliminary and in-depth desk review can be undertaken to assess relevant documents, including peer-reviewed literature, grey literature and other operational documents. The reports from all IARs conducted in the country should be included in this review because they may be especially important in highlighting any lessons learned that are relevant to public health events beyond COVID-19 and to extract recommendations that are still being implemented and others that may not yet have been implemented but whose relevance will need to be reassessed through the AAR.

The findings from the desk review should be compiled for easy reference to provide a baseline of background information and the context for the COVID-19 response. These findings may include the capacities and capabilities developed, the timeline of critical events, exemplar stories and lessons identified. The desk review may also provide information that can be used to develop additional trigger questions for the focus group discussions.

Countries are also advised to refer to the findings of WHO's global analysis of COVID-19 IARs *(13)*, which outlines how governments worldwide used their systems and resources, and developed innovative solutions and strategies during the pandemic. These findings can help inform the scope of the COVID-19 AAR and finalize the trigger questions in the context of national and local situations and priorities.

7.2 Online surveys

In each country, a large workforce may have been involved in the COVID-19 response, and it may not be realistic to interview each of them individually. Nevertheless, capturing their observations is essential to obtain a comprehensive picture of responders' first-hand experiences and to identify best practices, challenges and lessons learned.

A brief online survey disseminated to all responders via the country's COVID-19 incident management and command system or an equivalent entity will allow crucial perceptions to be collected from both the operational and strategic levels. Analysing responses to the survey will also help the AAR coordination team identify or confirm the themes that need to be discussed in more depth during the key informant interviews and focus group discussions.

7.3 Key informant interviews

Individual semi structured interviews may be conducted with members of senior leadership and selected responders using an interview guide based on the preliminary findings from the desk review and the online survey. These interviews aim to obtain feedback about personal experiences and perceptions from decision-makers and key responders. Supplemental best practices may emerge through these interviews as well as gaps in the public health response pillars, and key cross-cutting issues may also be highlighted. This information can then be used to refine the pillars to be reviewed during the focus group discussions and the trigger questions (Annex 3) to probe deeper into specific aspects of the response. In addition, key informant interviews may be beneficial to capture information from stakeholders who may not be able to attend the focus group discussions. Interviews may be done in person, via telephone or via video call.

7.4 Focus group discussions

Information collected from the initial phases of the COVID-19 AAR should be triangulated to aid in selecting and refining trigger questions (Annex 3), thus guiding focus group discussions according to the pillars reviewed. Questions should be open-ended because they are used primarily

to generate discussion and frame the scope of the analysis. They should be adapted to the context of and expected outcomes for each pillar. Focus group discussions can be conducted in person, online or in a hybrid format (i.e. with participants both in person and online).

Focus group discussions will involve a larger group of participants and should include about 6–10 people per pillar being assessed, with one note-taker and one facilitator per group. Together, the participants and facilitator will review the outputs from the previous phases to develop a collective and comprehensive perception of best practices, challenges and lessons identified.

In addition, regular plenary sessions should be held to discuss all pillars and to allow for shared learning, consensus-building and validation of recommendations for the different pillars being reviewed. These plenary sessions can also lead to a greater understanding of the interdependency between disciplines and among response stakeholders. They will also complement the work of the AAR by providing a prospective analysis. Finally, they will allow for the formulation of actionable and prioritized recommendations aimed at strengthening preparedness for and responses to future public health events and emergencies, especially to future pandemics.

Countries that conducted COVID-19 IARs or other response assessments can review their progress in implementing the activities recommended by the IAR, identify potential bottlenecks to implementation and devise new strategies and actions for correction and improvement during this phase.

7.5 Main steps for focus group discussions

The steps to follow when facilitating focus group discussions are outlined below.

- Step 1. Ask, what was in place before the response? Each group lists the country's national and subnational capacities and capabilities that existed prior to the emergence of COVID-19 and categorizes them.
- Step 2. Ask, what happened during the response? Participants build a timeline of what actually happened by mapping key milestones of the emergency in chronological order.
- Step 3. Ask, what went well? What went less well? Why? Participants identify strengths of the response and challenges, as well as new capacities developed, including contributing factors (i.e. enabling and limiting factors).
  - Also ensure that participants take note of any previous COVID-19 IARs or other response assessments conducted, the progress and impact of any recommendations implemented thus far, and ask them to identify any bottlenecks to implementation or areas for improvement.
- Step 4. Ask, what can we do to improve for next time? Have participants develop specific activities that can build on enabling factors and address limiting factors. Ask participants to propose remediation

actions to address the bottlenecks hampering the implementation of IAR recommendations.

- Step 5. Discuss how to move forward. Have participants prioritize activities based on their ease of implementation (i.e. for the short-, medium- and long-term) and impact on emergency preparedness and response activities.

Chapter 8

Multicountry and multisector COVID-19 after action reviews

As COVID-19 has demonstrated, infectious diseases are not contained by territorial borders, and as such WHO encourages engaging in multicountry and multisector COVID-19 AARs if practical. Multicountry COVID-19 AARs may be conducted at the regional, national or subnational levels. In addition, multisector reviews can be performed at any level among interested stakeholders.

Multicountry and multisector COVID-19 AARs may take two distinct forms: (i) two or more countries or sectors may jointly conduct a COVID-19 AAR or (ii) two or more countries or sectors may independently conduct a review and then share lessons learned during a joint consultation or conference. These forms can be scaled up to include more than two countries or sectors, if desired. The time commitment for a multicountry or multisector COVID-19 AAR is determined by the participants. However, it can range from a virtual consultation lasting several hours to an in-person consultation lasting several days.

Regional organizations are encouraged to consolidate regional or subregional experiences with COVID-19 to support and reinforce the lessons learned to improve preparedness for future outbreaks. WHO regional and country offices should be informed about such activities to support the mapping of lessons learned across countries. WHO will endeavour to support activities as needed. Publication and sharing of final reports is strongly encouraged to support peer-to-peer learning, and additional sharing, such as through publication in an academic journal, is also encouraged (Annex 4).

Chapter 9

Roadmap for follow up after the reviews

Once the AAR is complete, a comprehensive report about the elements of the response that were reviewed should be drafted, and it should include information about the strengths and weaknesses of the response, and the recommendations to be implemented. This report is the basis of the roadmap for follow up because it lays out the key findings and outcomes of the AAR. Then, based on the actions proposed in the report, a roadmap can be developed from the key findings and used to implement the recommendations.

The roadmap should be developed and agreed upon by participants and key stakeholders at the end of the review using a consensus-based process. The roadmap will facilitate the operationalization and monitoring of the recommendations. Fig. 3 describes some key steps in developing a post-AAR roadmap for implementing recommendations.

The roadmap should describe each proposed action and include key milestones, timelines, the human and financial resources necessary and measurable indicators, and it should specify who will be responsible for following up on the action plan. The roadmap will expedite the translation of the action plan into concrete improvements in processes and systems.

The roadmap should be aligned with or used to update the National Action Plan for Health Security, a Pandemic Preparedness and Response Plan, operational planning or other relevant planning processes.

Recommended activities should be monitored during the proposed timelines. WHO has developed a monitoring and tracking tool that countries can adapt to ensure recommendations are implemented successfully and on time (Annex 1). In addition, a follow-up committee should meet regularly to discuss progress and make changes or improvements to the activities recommended in the report from the AAR. During these meetings, the committee should address any bottlenecks to implementing the recommendations and identify concrete actions and the resources required to overcome them. Thus, the roadmap should be viewed as a living document that is subject to revision. Progress on the roadmap should be documented and the information used for reports and periodic revision, if necessary, to ensure that it meets the country's preparedness objectives.

While countries are the owners and custodians of the recommendations from the COVID-19 AAR, WHO and other partners can play essential and supportive roles in the implementation of recommendations, if and when requested. Specifically, WHO and its partners can assist or work directly with a country's health authorities by providing technical or financial support for specific activities. These types of cooperative efforts will also help WHO, its partners and countries jointly monitor progress through a predefined monitoring and tracking tool. This system provides empirical data about how the AAR's recommendations improve countries' emergency preparedness and response capacities and capabilities. Furthermore, partners can also play a crucial role in this process by providing critical resources and technical support; they should be included in organizing and as participants in all of a country's efforts to coordinate and prioritize joint actions and to mobilize resources.

Ministries of Health and other relevant stakeholders should also be advised to take advantage of the tools and platforms. Some potential tools that can be used by countries include the Resource Mapping *(14)* tool (known as REMAP) and the Partners Platform *(15)*. Countries may also develop investment cases based on COVID-19 AAR findings and leverage resources such as the pandemic fund, which finances critical investments to strengthen pandemic prevention, preparedness and response capacities at the national, regional and global levels, with a focus on low- and middle-income countries *(16)*.

The global analysis of reports from the COVID-19 IARs highlighted the need for countries to learn from approaches taken by peer countries and other programmes *(13)*. This knowledge can be leveraged to identify reliable and systematic approaches to informing strategies for following up on and monitoring AAR recommendations, to ensure that progress is made according to proposed timelines and that the desired outcomes are achieved.

Fig. 3. Roadmap for follow up of country COVID-19 after action reviews

AAR: after action review.

Chapter 10

The Nuggets of Knowledge platform for health emergency management

In today's rapidly evolving world, the importance of a robust knowledge management system for outbreaks and health emergencies cannot be overstated. The COVID-19 pandemic has highlighted how accessing, processing and disseminating critical knowledge can help guide decision-making processes during the response, especially in uncertain times.

WHO is developing a comprehensive knowledge management system to foster the retention of knowledge gained at the country level during the response to the COVID-19 crisis and other outbreaks or emergencies, and to maintain continuity of knowledge that will inform future responses.

Such a system will serve as a foundation for effectively addressing and mitigating the impact of infectious diseases, epidemics and other health crises. By capturing, organizing and disseminating vital information, the system will enable timely and informed decision-making at all levels of response, from frontline responders to policy-makers.

The Nuggets of Knowledge (or NoK) platform for health emergency management proposed by WHO is designed to capture knowledge gathered from early action reviews, IARs and AARs in the form of digestible contents (i.e. nuggets) within a collaborative and interactive platform, and, most importantly, make the knowledge readily accessible to countries and key responders.

Tacit knowledge will be captured, processed and reused to support rapid decision-making to help manage public health emergencies at the national and subnational levels during current and future health emergencies. Countries and individuals can access and utilize this knowledge for similar or related events or emergencies. This will help enhance predictability and accountability in emergency management by ensuring that past experiential knowledge is available to the right people at the appropriate time to facilitate adaptive decision-making and inform policies.

The Nuggets of Knowledge platform aligns with WHO's guidance for conducting AARs published in 2019 that advises countries to create a repository of key challenges, best practices and recommendations resulting from AARs, which can be easily accessed while preparing for and

responding to an emergency. Such a repository can help build institutional memory of systems and organizations, and provide a resource for emergency preparedness and response stakeholders. The database of lessons learned can be used by the country that experienced the event and also by other countries that may be facing similar events or that are interested in strengthening their preparedness capacities by institutionalizing best practices and anticipating potential challenges should a similar event occur.

Chapter 11

Supporting tools

Several tools are available from WHO to support countries in planning and conducting a COVID–19 AAR. A list of these tools are available in Annex 1 or they can be retrieved directly from the WHO Emergency Response Reviews website *(17)*. Each country can decide which tool is relevant, and the tools can be customized to each country's context and the specific objectives of their COVID–19 AAR.

WHO has also published a series of training courses on planning, managing and facilitating a COVID-19 IAR *(18)* and a generic AAR *(19)*. The generic AAR course is available in Arabic, English, French, Portuguese, Spanish and Russian. These courses will help support planning for a COVID-19 AAR.

The COVID-19 AAR toolkit and supplementary material include the following: COVID-19 AAR guidance, a concept note template, facilitator's manual, generic agenda template, generic presentation, COVID-19 AAR trigger question database (Annex 3), note-taking template, final report template, participant feedback form, a summary table for participant feedback and an exemplar story template.

Since the COVID-19 pandemic there has been an increase in remote and hybrid working; thus, a checklist is provided that outlines issues to consider when conducting an online or hybrid AAR. The checklist is part of the COVID-19 AAR toolkit (Annex 1).

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Annex 1

Supplementary tools to help plan and conduct a country COVID-19 after action review

The supplementary tools described in Table A1 are designed to support planning for and conducting a country COVID-19 after action review (AAR). The tools build on those produced for previous guidance about after action and intra–action reviews (IARs). They have been adapted to incorporate the lessons learned from conducting AARs and IARs over several years and in particular during the COVID–19 pandemic.

Table A1. Supplementary tools for a country COVID-19 after action review

Supplementary tool	Description
1. Concept note template *(1)*	This template outlines the key elements needed to prepare an AAR (i.e. the scope, objectives and date of the review; key participants; methodologies; proposed budget; team members and their roles).
2. Facilitator's manual *(2)*	The manual includes instructions and recommendations for facilitators to help with organizing and conducting an AAR. The manual highlights key components that may need to be adapted to the national COVID-19 context.
3. Generic agenda template *(3)*	This template for an agenda can be adapted depending on the format of the AAR (e.g. online or onsite) and the number of technical areas or pillars to be reviewed.
4. Generic presentation template *(4)*	This generic presentation can be adapted to the country's specific context to facilitate the process of conducting a country-level COVID-19 AAR.
5. Country COVID-19 AAR trigger questions database (**updated**) *(5)*	This resource file has more than 700 trigger questions from which facilitators can select to stimulate reflection and discussion within the group, and they can be tailored according to the needs of the review.
6. Note-taking template *(6)*	This template can assist in capturing the discussions during each step of the AAR, and the notes can later help with writing the final report.
7. Final report template *(7)*	The report writer can use this template to summarize the analyses and recommendations from the review in a structured manner.
8. Participant feedback form *(8)*	This form can be used to collect feedback from participants at the end of the AAR about how it was conducted and how useful it was.
9. Participant feedback form summary table *(9)*	This Excel file can be used to analyse participants' feedback.
10. Exemplar story template *(10)*	Countries can use this template to document what worked during their response to COVID-19. In addition, these success stories should be shared broadly with other countries, with WHO and with partners to enable peer-to-peer learning about best practices or new capacities in the country.
11. Conducting effective online or hybrid COVID–19 AARs checklist (**updated**) *(11)*	This document outlines how to prepare for and conduct an online or hybrid (i.e. both online and in person) COVID-19 AAR.
12. Post–AAR improvement action plan monitoring tool (**new**) *(12)*	The tool can be used to monitor the progress made in implementing each proposed action and specify the key milestones, timelines, human and financial resources, and responsible persons or entities. It can also help highlight any bottlenecks that affect implementation and track corrective measures.

AAR: after action review; COVID-19: coronavirus disease.

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Annex 2

Methods used to develop the country COVID-19 after action review guidance and tools

This Guidance document is based on the after action review (AAR) methodology published in 2019 by WHO *(1)*. During the COVID-19 pandemic in 2020 and 2021, WHO published guidance and an addendum for conducting COVID-19 intra-action reviews (IARs) *(2, 3)*. Since the guidance in this document is specific to COVID-19 AARs, we based the methodological approach on the 2019 AAR guidance. In addition, since the guidance for IARs is more recent than that for AARs, we needed to link the findings from the IARs to the COVID-19 AAR. Thus, we recommend building on any COVID-19 IARs that have already been conducted in a country as the foundation for a COVID-19 AAR. We encourage countries in that are not in protracted COVID-19 emergencies and who have conducted IARs to follow this same approach when implementing their AARs after an emergency.

Furthermore, the methodology is based on the public health response pillars and trigger questions found in this COVID-19 AAR Guidance and example trigger questions can be found in Annex 3. The IAR guidance published in 2021 had 14 pillars that could be reviewed by countries, each with a set of suggested trigger questions to facilitate discussions among a working group. To develop this COVID-19 AAR guidance, we drew on feedback from leads of incident management and support teams (IMSTs), countries that had conducted IARs and the global synthesis of the findings from more than 80 IARs to propose five new pillars. The guidance and trigger questions from both old and new pillars were reviewed by all IMST pillar leads, WHO's regional offices and technical partners. This final Guidance reflects their input.

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Annex 3

Examples of country COVID-19 after action review trigger questions

This annex provides examples of trigger questions that can be used during a coronavirus disease (COVID–19) after action review (AAR) (Table A3). Facilitators and interviewers can refine and use trigger questions to help focus discussions and key informant interviews. The list of pillars and questions covered in the table below is not exhaustive and the choice of questions will depend on the scope chosen by the country for its COVID–19 AAR. Please refer to the trigger question database for the complete list of questions at: https://apps.who.int/iris/bitstream/handle/10665/371850/WHO-2019-nCoV-Country-AAR-templates-trigger-questions-2023.1-eng.xlsx.

Table A3 Examples of trigger questions that can be used in country COVID-19 after action reviews, by pillar

Pillar	Example trigger questions
Country-level coordination, planning and monitoring	What were the operational coordination mechanisms for health emergencies within the Ministry of Health and other relevant ministries (e.g. an emergency operations centre)?
	How was coordination between different health and non-health ministries and the different levels within the ministries supposed to happen during a health emergency (including in the field)?
	What were the plans, systems and mechanisms for facilitating multisectoral coordination? What is the process for activating them?
	What were the mechanisms for coordinating with international and national partners (e.g. the United Nations, nongovernmental organizations)?
	What was the process for declaring an emergency and deescalating the emergency response?
	What was the process for rapid information-sharing within the government and among officials and partners for decision-making in the event of a health emergency?
	Which systems were adapted to aid coordination between the Ministry of Health and other ministries and agencies during the COVID-19 response, and what new systems and procedures were instituted on an ad hoc basis? How well did these work?
	Which plans (e.g. influenza pandemic preparedness plan) were adapted for the COVID-19 outbreak, and what new systems were instituted on an ad hoc basis? How well did these work?

Continues ...

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Pillar	Example trigger questions
Surveillance, case investigation and contact tracing	What types of surveillance data and surveillance or early warning systems were in place to detect outbreaks, especially those originating from respiratory pathogens?
	What guidelines, standard operating procedures and protocols were in place to guide surveillance and response activities?
	What was the process for analysing data and providing public health information for decision-making?
	What was the legal framework for rapid response teams, and how were their roles defined during a health emergency?
	How was surveillance data linked to laboratory data (e.g. via an interoperable electronic information management system)? How did this differ for surveillance of notifiable diseases and surveillance for an outbreak of a novel pathogen?
	What types of training had surveillance officers and rapid response teams received prior to the detection of the first case of COVID-19 in the country?
National laboratory system	What system was used to accredit laboratories or designate them to test for COVID-19 before the first case was detected in the country?
	What plans, guidelines and standard operating procedures were in place to ensure the safe shipment and testing of specimens from suspected cases of COVID-19 at national and subnational laboratories before the first case was detected in the country?
	What were the procedures for sharing information and making decisions among laboratories (including animal health laboratories), public health offices, epidemiologists and government officials?
	What systems and regulatory procedures were in place to enable new diagnostic assays to be approved for use in the country and rolled out to testing laboratories (e.g. nucleic acid amplification tests) or health facilities (e.g. antigen detection rapid diagnostic tests)?
	What are the policies for providing diagnostic testing for COVID-19 in the country, and how did these change throughout the outbreak?
	What was the process for confirming a COVID-19 case by laboratory testing? How was information from laboratories managed and connected with epidemiological data at public health departments?
	What was the process for reporting laboratory findings to a treating physician and, subsequently, to confirmed COVID-19 cases or to individuals who tested negative for COVID-19? Had processes already been established using regular channels, or were new processes developed during the response?
Considering vulnerable and marginalized populations	What was the process for considering the unique needs of vulnerable and marginalized populations during a public health emergency?
	What special provisions were available in the country before the COVID-19 outbreak started (e.g. specific infrastructure, allocation of financial and human resources)?
	What types of plans, strategies and procedures existed to guide the protection of vulnerable and marginalized populations during a public health emergency? When are these supposed to be activated and utilized?
	What was the process for developing and approving messages tailored to vulnerable and marginalized populations?
	Which plans, coordination mechanisms or systems were adapted to address the unique needs of vulnerable and marginalized populations during the COVID-19 outbreak, and which new systems were instituted on an ad hoc basis? How well did these work?
	Were existing strategic response plans effective in ensuring that a coordinated, multisectoral national response to COVID-19 addressed vulnerable and marginalized populations?
	Were civil society organizations, people who received care and minority groups represented in decision-making structures?
Preventing and responding to sexual exploitation, abuse and harassment	To what extent were safeguarding measures implemented and enforced?
	To what extent were safeguarding measures implemented as part of the COVID-19 response operations?
	How were briefings and trainings about preventing and responding to sexual exploitation, abuse and harassment for personnel, partners and other collaborators implemented as part of the COVID-19 response?
	To what extent was WHO embedded in and to what extent did WHO contribute to joint network activity to prevent sexual exploitation and abuse under the United Nations coordination mechanism?
	When was a focal point or technical specialist for preventing sexual exploitation, abuse and harassment embedded in the incident management support team to strengthen mainstreaming, and are there a sufficient number of trained focal points?
	Was a risk assessment conducted, and were mitigation measures developed and implemented?
	What were the key components of mainstreaming activities to prevent and respond to sexual exploitation, abuse and harassment in the COVID-19 response, and to what extent were they integrated into response plans and funding appeals or efforts to mobilize resources?

Annex 4

Examples of multicountry learning in academic literature

Multicountry learning in the form of intra- and after action reviews is described in the academic literature. Two helpful examples demonstrating different approaches are:

- Sane J, Schmidt T, Isla N, Ibrahim R, Boshevska G, Mayigane LN, et al. Key lessons learnt from COVID-19 intra-action reviews in the Republic of Moldova, Montenegro, Kosovo and North Macedonia 2020–2021: a qualitative study. BMJ Open 2023;13:e066279. doi:10.1136/bmjopen-2022-066279;
- Riccardo F, Bolici F, Fafangel M, Jovanovic V, Socan M, Klepac P, et al. West Nile virus in Europe: after action reviews of preparedness and response to the 2018 transmission season in Italy, Slovenia, Serbia and Greece. Global Health 2020;16:47. doi:10.1186/s12992-020-00568-1.

These examples provide insight into the value of conducting intra-action and after action reviews in multiple countries. This Guidance does not intend to be overly prescriptive about how multicountry reviews should occur but seeks to encourage multicountry learning in any form as a best practice tool to improve national and regional responses. ■

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