Strengthening health emergency preparedness and response in the WHO South-East Asia Region building upon lessons learnt from COVID-19

Bolstered by the Regional Flagship Programme on Emergency Risk Management since 2014, enabled by the ministerial-level political commitment encapsulated in the Delhi Declaration on Emergency Preparedness in the South-East Asia Region of 2019, and guided by the five-year Regional Strategic Plan to strengthen public health preparedness and response as well as the Risk Communication Strategy for public health emergencies in the WHO SE Asia Region 2019–2023, Member States of the Region have progressed significantly in advancing core capacities mandated by the International Health Regulations (IHR, 2005) for health emergency preparedness and response.

However, the intra-action reviews (IAR) of the COVID-19 response undertaken by many Member States in 2020 and 2021 clearly revealed that the levels of preparedness and response readiness that existed were not sufficient to effectively manage such a severe health emergency. The Seventy-fourth session of the WHO Regional Committee for South-East Asia in September 2021 recommended ‘further synthesis of the lessons learnt from the COVID-19 response at a regional level’ and the ‘development of a Regional Roadmap to strengthen health security in the Region’.

A Regional Consultation of Member States and representatives of partner agencies and experts in October 2021 discussed and consolidated the lessons learnt from the COVID-19 response and provided key recommendations to close the gaps identified in the core capacities. Sustained investment, enhanced partnerships and regional support platforms in public health emergency preparedness and response, and PHC-oriented resilient health systems enabled by digital technology and local manufacturing capacities for equitable access to emergency services and products, were among the main recommendations by the experts.
In compliance of the recommendations of the Seventy-fourth Regional Committee session, a Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027 was drafted, based on the lessons learnt in the Region and the recommendations made, while taking cognizance of the global developments to strengthen pandemic and health emergency preparedness and response. The draft was reviewed and discussed at a virtual Regional Meeting of representatives of Member States, WHO country offices and partners held on 29 June–1 July 2022. Feedback obtained from all stakeholders, were used to revise the draft Regional Strategic Roadmap.

The Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027 focuses on:

a) interventions needed to strengthen the capacity of the Member States to detect, contain and mitigate any future health emergency through building sustainable health security systems and enhancing health system resilience for emergencies; and

b) regional initiatives and platforms linked with global initiatives that are critical to augment and support Member State capacity at the regional level.

It also seeks to provide guidance on the well-articulated steps to be taken during different phases of a health emergency to reduce its multidimensional impact on people and service providers, protect the vulnerable, safeguard and ensure health system resilience and enable rapid recovery.

Focusing on the laboratory core capacity, the pandemic’s impact on diagnostic pathways that increase the existing inequities in access to essential laboratory services were considered, lessons learnt consolidated and recommendations to strengthen the public health laboratory and diagnostics systems were made at the virtual Regional Meeting in October 2021. These include formalizing mechanisms needed for laboratory workforce surge during emergencies, digitalizing laboratory reporting platforms and establishing a Diagnostic Technical Advisory Group at national and regional levels, as well as strengthening collaborative platforms for genomic surveillance.

Two complementary and interconnected regional initiatives: (1) the Regional Strategic Action Plan for enhancing genomic surveillance for pathogens of pandemic and epidemic potential in the South-East Asia Region; and (2) the South-East Asia Regional Roadmap for diagnostic preparedness and integrated laboratory networking, have been formulated to comply with the recommendations pertaining to public health laboratory capacity strengthening.

Representatives of Member States, WHO country offices and partners have been consulted on these initiatives at a virtual consultation on 28–29 June 2022. Based on the feedback received, the two documents listed above were revised and combined into the South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027.
The Working Paper on this Agenda item was presented to the High-Level Preparatory Meeting for its review and recommendations. The HLP Meeting reviewed the paper and made the following recommendations for consideration by the Seventy-fifth Session of the Regional Committee.

**Actions by Member States**

1. Develop or revise and implement the national action plans on health security (NAPHS) as guided by the Regional Strategic Roadmap to strengthen health security capacity and build resilient health systems through sustainable financing and in coordination with relevant stakeholders.

2. Utilize various IHR-MEF tools and other appropriate mechanisms for continued assessment, to guide periodic revision of NAPHS for prioritized preparedness and response interventions on a continual basis.

3. Increase political commitment, investments and high-level partnerships to modernize diagnostics, laboratory and surveillance systems with strong early warning functions.

**Actions by WHO**

1. Facilitate the establishment of partnerships and mobilization of resources and support Member States in advancing the Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027, through implementation of the revised NAPHS in countries.

2. Provide global policy guidance and country-contextualized technical tools and facilitate implementation and monitoring of NAPHS for a stronger regional health security architecture.

3. Facilitate the operationalization of the Regional Diagnostic Advisory Group, Expert Laboratory Network of the South-East Asia Region, and Regional Genomic Surveillance Consortium in collaboration with Member States and partners.

4. Facilitate the establishment of partnerships and mobilization of resources, and support Member States in implementing the South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027.

This Working Paper, along with the two Regional Roadmaps (Annexure 1: South-East Asia Regional Roadmap for Diagnostic Preparedness, Integrated Laboratory Networking and Genomic Surveillance 2023–2027; and Annexure 2: Regional Strategic Roadmap on Health Security and Health System Resilience for Emergencies 2023–2027) and the HLP Meeting recommendations are submitted to the Seventy-fifth Session of the WHO Regional Committee for South-East Asia for its consideration and decision.
Introduction

1. Strengthening health emergency preparedness and response has been an important health priority in the World Health Organization’s South-East Asia Region. Scaling up capacity development in emergency risk management in countries is a Regional Flagship Priority Programme initiated by the Regional Director in 2014 and was further endorsed by the honourable health ministers of the Member States of the Region through the Delhi Declaration on Emergency Preparedness in the South-East Asia Region at the Seventy-second session of the WHO Regional Committee in 2019. Implementation of emergency risk management (ERM) interventions have been guided by the five-year Regional Strategic Plan to strengthen public health preparedness and response 2019–2023 as well as the Risk Communication Strategy for public health emergencies in the WHO SE Asia region 2019–2023.

2. Supported and guided by the enabling instruments enumerated above, Member States in the Region have been making considerable progress in advancing core capacities mandated by the International Health Regulations (IHR, 2005) for health emergency preparedness and response.

3. However, the COVID-19 pandemic has revealed that the existing level of preparedness and response readiness was not adequate to effectively manage a health emergency of such severity and extent. This has been amply illustrated from the findings of the intra-action reviews (IAR) conducted by several Member States and at the regional level in 2020 and 2021.

4. The SARS-CoV-2 or COVID-19 pandemic is not the last such pandemic. Infectious disease risks with the potential to cause public health emergencies of international concern (PHEIC) are constantly emerging, with the ongoing Monkeypox virus disease outbreak since April 2022 in Europe and other parts of the world being a case in point. Risks from infectious and other hazards demand a stronger, more resilient global health security framework with sustained investment that is adaptable to the regional and country contexts. Many global initiatives to strengthen the global health security architecture are ongoing.

5. The Review Committee on the Functioning of IHR (2005) during the COVID-19 response and the Independent Panel on Pandemic Preparedness and Response have issued recommendations with important implications for enhanced global and regional health security. The final report of the Working Group on Preparedness and Response to Health Emergencies has acknowledged IHR (2005) as a key component of the global health security architecture. The ongoing Intergovernmental Negotiating Body (INB) and the Working Group on Amendments to the IHR (2005) are also collaboratively involved to strengthen the global health security architecture.
6. The Seventy-fourth session of the WHO Regional Committee for SE Asia in September 2021 recommended “further synthesis of the lessons learnt from the COVID-19 response at a regional level”, and the “development of a Regional Roadmap to strengthen health security in the South-East Asia Region”. To comply with the recommendations of the Regional Committee session, a Regional Consultation of representatives of Member States and partner agencies and experts was held virtually in October 2021 under the aegis of the Department of Health Emergencies of the Regional Office. The Regional Consultation discussed and consolidated the lessons learnt from the COVID-19 response and provided key recommendations to close the gaps identified in the core capacities, policies and partnerships. It also drafted the Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027, based on the lessons learnt in the Region and the recommendations made while taking cognizance of the global developments to strengthen health security and health system resilience.

Current situation, response and challenges

7. Despite challenges such as the COVID-19 pandemic, Member States in the Region have made considerable progress in building the core capacities to comply with the terms of IHR (2005). Countries have fully utilized existing core capacities to respond to the unprecedented pandemic in order to control transmission and save lives. However, the COVID-19 pandemic has revealed that the current level of preparedness and response readiness as documented and reported using the mandatory and voluntary tools of the IHR Monitoring and Evaluation Framework (IHR-MEF) are not adequate to effectively manage severe health emergencies on such a scale.

8. The Region adopted the IHR-MEF to measure and report on the progress in strengthening mandated core capacities, enhance accountability, foster continuous learning and design, and implement and improve interventions prioritized in their National Action Plans on Health Security (NAPHS). Member States of the Region have maintained 100% compliance in submitting the mandatory States Parties Self-Assessment Annual Reports (SPAR) on IHR compliance status since 2016. Eight Member States, namely Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste, have conducted the voluntary joint external evaluation (JEE) of IHR (2005) between 2016 and 2018. Many Member States have also conducted after-action reviews (AAR) following incidents of acute humanitarian and other emergencies and simulation exercises (SimEx) to test their preparedness and response plans.

9. As per the SPAR for 2021, five Member States in the Region had an average score of 41–60% for 15 IHR core capacities, four Member States scored an average of 61–80% and two Member States an average that crossed 80%. The lowest regional average score was reported for policies to manage chemical events followed by the scores for the status of functional legal and normative instruments to facilitate emergency risk management, and capacities to manage food safety and radiation emergencies. The highest regional average score was for surveillance capacity followed by risk communication and health emergency management, all of which have benefitted by being augmented for the COVID-19 response.
10. JEEs planned in 2020 and 2021 were postponed due to the COVID-19 pandemic. The regional overview of IHR (2005) capacity over 19 technical areas as per the JEE conducted so far by eight Member States reflects significant progress in areas of national legislation, policy and financing; IHR coordination, communication and advocacy; immunization services; laboratory capacity, surveillance and reporting; and risk communication, compared with the preceding SPARs. Two Member States (Nepal: initial, and Thailand: repeat) have committed to conduct their JEE in 2022 using the JEE tool that was revised based on COVID-19 lessons learnt and recommendations from technical consultative meetings.

Fig. 1. Regional average score of JEE from 8 Member States of the SE Asia Region

11. Long before the COVID-19 outbreak, the Region had prioritized the strengthening of preparedness and response by instituting the Regional Flagship Priority Programme to “Scale up capacity development in emergency risk management in countries”. Since 2018, WHO has been working closely with Member States and partners to support the development of NAPHS based on a “One Health” and whole-of-government approach for all hazards to accelerate the implementation of interventions to enhance IHR core capacities. The development and updating of the plans have been informed by findings from the four components of the IHR-MEF: SPAR, JEE, AAR, and SimEx and other internal assessments.
12. Following the IHR assessments, especially JEE, seven Member States, namely Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste, have developed and implemented the NAPHS, while Bangladesh is awaiting endorsement. The plans are aligned with the national health sector plans linking activities using a “One Health” approach and encompass overarching health system strengthening with full government and societal involvement.

13. The operationalization of NAPHS in the countries has been challenged by competing priorities between health and non-health sectors, governance issues, political commitment and lack of sustainable financing. Intersectoral cooperation and adequate financing for emergency preparedness as opposed to response is necessary for the sustained implementation of NAPHS. A significant development has been the setting up of the “Preparedness Stream” of the South-East Asia Regional Health Emergency Fund (SEARHEF) in 2016 for catalyzing preparedness interventions prioritized in NAPHS. The Preparedness Stream of SEARHEF will strengthen key aspects of emergency preparedness such as disease surveillance, health emergency workforce, health emergency teams and IHR core capacities.

14. Bolstering capacities of IHR national focal points (NFP) remains a high priority for the Region. Even during the pandemic, meetings of IHR national focal points were conducted periodically through the virtual medium to share the best practices in the COVID-19 response among Member States as well as to provide updates on the prevailing epidemiological situation, new approaches and technical guidelines for pandemic response. In addition, the Regional IHR Knowledge Network has served as a common online platform for informal sharing of information, experiences and good practices fostering peer-to-peer learning between NFPs, guidance from experts as well as for conducting online capacity-building through webinars and virtual meetings.

15. Recently, a new IHR-MEF mechanism called Universal Health and Preparedness Review (UHPR) has been introduced and is being piloted to further enhance mutual trust, accountability and solidarity between Member States to collaborate in strengthening national capacities not only for health emergency preparedness but also enhancing universal health coverage and ensuring healthier populations. The first pilot of the UHPR in the Region was conducted in Thailand in April 2022. The UHPR is a platform for building mutual trust, accountability and solidarity within and between countries to strengthen national capacities for pandemic preparedness, universal health coverage and healthier populations.

Lessons learnt from COVID-19 and advances to regional health security

16. The COVID-19 pandemic has caused unprecedented adverse health impacts as well as social and economic disruptions globally. When the response to this global emergency moved into a protracted phase, there arose the need to conduct periodic reviews of the ongoing response to identify opportunities to further strengthen country emergency preparedness and response and institute course corrections in the response as needed. This was done through the modification of the AAR into an intra-action review methodology. An IAR provides a unique opportunity to bring all stakeholders together from different parts of the government, private sector and civil society to collectively reflect on their response, identify best practices, challenges and lessons learnt and come up with immediate and mid- to long-term recommended activities to continually improve their COVID-19 preparedness and response, which also has a bearing on overall emergency risk management.
17. In the SE Asia Region, Bangladesh, Bhutan, India (the state of Gujarat), Indonesia, Nepal, Sri Lanka and Thailand have reported on multistakeholder IARs of their COVID-19 responses that have been conducted. Indonesia also conducted six follow-up monitoring meetings to periodically monitor the implementation of the recommendations that emerged from the IAR. Some Member States have also conducted intra-action reviews of the COVID-19 vaccination exercise to document the good practices and identify challenges that were faced during the vaccine roll-out.

18. Building regional and national health security systems requires long-term vision and committed political leadership for precise direction and sustainable financing. Member States, WHO and other partners worked together to identify the key learnings and gaps from the COVID-19 response to prioritize actions to further strengthen health security and health system resilience. This will make the response to the ongoing pandemic more effective and better prepare Member States for future pandemics and other emergencies.

19. As such, the Seventy-fourth Regional Committee session in 2021 recommended “further synthesis of the lessons learnt from the COVID-19 response at a regional level” and the “development of a Regional Roadmap to strengthen health security in the SE-Asia Region”. Responding to these recommendations, the Regional Office organized a series of meetings with experts and Member States and partners in October 2021. Through these regional meetings, Member State delegates shared crucial lessons across 12 technical areas – 10 technical areas as per the WHO Strategic Preparedness and Response Plan (SPRP) for COVID-19 plus two additional technical areas.

20. The consultations with the Regional Director’s Expert Working Group also identified policy and system enablers for more effective preparedness, response and resilience. It outlined learnings from national response covering areas such as health emergency governance, primary health-care oriented resilient health systems, adaptable systems for effective care pathways, containment operations and public health measures, and risk communication and the management of infodemics. Recommendations that covered regional and global mechanisms including the regional platform for alert, preparedness and response, pathogen genetic sequencing, enhanced use of digital technologies and capacitating local manufacturing for equitable access to emergency services and products and research and development were also proffered.

21. An often neglected aspect of health systems strengthening is diagnostics and laboratory systems. The COVID-19 response highlighted the critical requirement of diagnostic preparedness as a country’s ability to respond to emergencies. At the Seventy-fourth World Health Assembly in May 2021, Member States were urged to increase their capacity to detect new threats, including through laboratory techniques. Lessons learnt were consolidated and recommendations to strengthen the public health laboratory and diagnostics systems were made at the above-mentioned Regional Meeting in October 2021. These include formalizing mechanisms needed for laboratory workforce surge during emergencies, digitalizing laboratory reporting platforms and establishing a Diagnostic Technical Advisory Group at national and regional levels, including strengthening collaborative platforms for genomic surveillance.
The way forward

Strategic issues

22. The five-year Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027 was developed in a collaborative and participatory manner involving ministries of health of Member States and public health experts, based on the lessons learnt in the regional context from the pandemic response and taking into consideration global initiatives and developments that strengthened the pandemic and health emergency preparedness and response architecture, mechanisms and processes and bolstered global solidarity and accountability. It aims to serve as guidance to the Member States of the Region in their efforts to strengthen national health security and health system resilience for emergencies and contribute to the consolidation of the collective, supportive and augmenting capacities needed at the regional level.

23. A draft Regional Strategic Roadmap was presented by the WHO Secretariat at the regional level and deliberated upon at a regional meeting conducted in hybrid mode on 29 June–1 July 2022. The regional meeting provided the opportunity to brainstorm and revise the draft Regional Strategic Roadmap on Health Security and Health Systems Resilience for Emergencies 2023–2027 and enable the sunsetting of the five-year Regional Strategic Plan to strengthen public health preparedness and response 2019–2023 one year before the end of its tenure. This is because the experience gained during, and the lessons learned from, the pandemic response have driven the need for an updated strategic roadmap to be developed and implemented at the earliest opportunity. The feedback and recommendations from this regional meeting were used to finalize the draft Strategic Roadmap and also outline the approaches to operationalize the roadmap and monitor and evaluate its implementation status.

24. The Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027 focuses on:

   a) interventions needed to strengthen the capacity of the Member States to detect, contain and mitigate any future health emergency through building sustainable health security systems and enhancing health system resilience for emergencies; and

   b) regional initiatives and platforms linked with global initiatives that are critical to augment and support Member State capacity at the regional level.

25. It also seeks to provide guidance on the well-articulated steps to be taken during different phases of a health emergency to reduce its multidimensional impact on people and service providers, protect the vulnerable, safeguard and ensure health system resilience by enabling rapid recovery to normalcy. Furthermore, health systems, in tune with the WHO notion of and aim to “build back better” resilience post-emergency, should also ideally return to a higher level of capacity and performance following an outbreak and after its cessation based on the lessons learnt and experience gained from the response.
26. The Regional Strategic Roadmap recognizes that in addition to health emergencies common to the entire Region, Member States face different threats and have different levels of capacity. However, the fundamental principles of implementation remain the same across countries. It highlights the foundational role of knowledge gained from past experience and research; the need to prioritize interventions based on analysis of hazards, vulnerability and capacity gaps identified; and to develop capabilities for building absorptive, adaptive and transformative system resilience through a whole-of-government approach involving communities and harnessing technology and implementation research.

27. Member States may consider reviewing and updating their NAPHS based on the Regional Strategic Roadmap on health security and health system resilience for emergencies. Continual monitoring and periodic assessment of the implementation of NAPHS may be undertaken in alignment with existing national evaluation mechanisms such as the IHR (2005) Monitoring and Evaluation Framework to avoid burdening Member States with additional data collection and reporting requirements.

28. Sustainable financing to strengthen national health security and build resilient health systems demands unwavering political commitment, concerted efforts from multiple stakeholders and committed national and international partnerships. Member States, in collaboration with different stakeholders in global health security, may develop financing strategies that link to the prioritized activities in the NAPHS as guided by the Regional Strategic Roadmap with increased domestic investment complemented by the mobilization of external support to fill gaps in the resource envelop.

29. Responding to resolution WHA74.7 on “Strengthening WHO preparedness for and response to health emergencies”, two regional initiatives were developed in consultation with Member States: 1) South-East Asia Regional Roadmap for diagnostic preparedness and integrated laboratory networking; and 2) Regional Strategic Action Plan for enhancing genomic surveillance for pathogens of pandemic and epidemic potential in the South-East Asia Region. The interconnected strategies provide a framework for investments, collaborative partnerships and political commitment to advance diagnostic preparedness and regional laboratory networking and propose critical actions needed to modernize diagnostics, laboratory and surveillance systems as early warning and decision support mechanisms.

30. Member States in collaboration with different stakeholders may consider increasing investments in diagnostics and laboratory systems, supporting the development of new diagnostic tools, especially those which can be delivered within the community, and promoting high-level partnerships to ensure national systems are of adequate quality to prepare for and prevent or contain the next pandemic.

31. The Regional Strategic Roadmap on health security and health system resilience for emergencies 2023–2027 clearly recognizes the important role of diagnostics for effective health care and successful outbreak detection and containment including through the value addition provided by optimal pathogen genomic sequencing capacity.
32. The opinion and endorsement of the Regional Committee are being sought for finalization of the drafts and recommendations of the WHO SE Asia Region High-Level Preparatory Meeting on: 1) the Regional Strategic Roadmap on health security and health system resilience for emergencies 2023–2027; and 2) the South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027.

33. A Regional Health Emergency Council comprising the honourable Heads of States of Member States of the SE Asia Region is planned to be established to take stock of, deliberate upon, decide and recommend interventions biennially or on an ad hoc basis when required. The proposed Council will have the following mandates:

   a) address obstacles to equitable and effective health security ensuring collective, whole-of-government and whole-of-society action, aligned with global and regional health emergency goals, priorities and policies;
   
   b) foster compliance with and adherence to global and regional health agreements, norms and policies; and
   
   c) identify needs and gaps, swiftly mobilize resources, and ensure effective deployment and stewardship of these resources, for enhanced health security and health system resilience in emergencies.

34. The specific terms of reference and the Secretariat mechanisms of this planned “Regional Health Emergency Council of Heads of States of SE Asia Region Member States” will be agreed upon in consultation with Member States and stakeholders in due course.

**Conclusions**

35. The COVID-19 pandemic has dramatically illustrated the impact of health emergencies not only on health but also on national economies and social welfare. It clearly demonstrates that the risk of adverse consequences will be high as the Region bears a high burden of outbreaks, and of emerging and re-emerging diseases including zoonoses, in addition to high vulnerability to other natural and human-induced disasters.

36. The ongoing response to the COVID-19 pandemic has also aided Member States individually and the Region collectively to clearly identify the gaps in IHR core capacities that are critical for preparedness for, response to and recovery from emergencies. By effectively utilizing the valuable lessons learnt, Member States can strengthen national health security and health system resilience for emergencies through committed political leadership, a whole-of-society approach, and sustainable financing. Sustaining and accelerating regional health security capacity and health system resilience needs to be top priority for Member States to safeguard the development gains achieved so far.
37. Reviewing, revising and implementing the national action plans on health security and the National Strategic Plan for Health System Strengthening drawing from the Regional Strategic Roadmap on health security and health systems resilience for emergencies 2023–2027 as the guiding template would definitely assist Member States and the Region to enhance health security and ensure the building of health systems that are resilient to emergencies.

38. The Regional Committee is requested to review the South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027 (Annexure 1); the Regional Strategic Roadmap on health security and health systems resilience for emergencies 2023–2027 (Annexure 2); and the proposal for the establishment of the Regional Health Emergency Council of Heads of States of the South-East Asia Region’s Member States, offer any recommendations it deems pertinent, and consider adopting the two Regional Roadmaps and endorse the establishment of the Regional Health Emergency Council.
Annexure 1

WHO South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance (2023–2027)

Working Draft

August 2022

World Health Organization
South-East Asian Region
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Foreword

Within the WHO South-East Asia Region there has been accelerated progress towards strengthening laboratory systems and diagnostic capacity during the COVID19 pandemic. Reliable laboratory services play a critical role in ensuring efficiency and effectiveness of surveillance and prevention of major emerging, re-emerging and endemic communicable and noncommunicable diseases, including diagnosis, prevention, treatment, research and health promotion.

The COVID-19 pandemic has been a wake-up call for countries in the Region and across the world to invest in diagnostic and surveillance systems as the backbone of resilient health-care systems. It has highlighted that diagnostic tests and laboratory capacity are as essential as medicines.

But diagnostics are not just about pandemic preparedness and emergency response. Ensuring the availability, accessibility, affordability and quality of diagnostics is a key element of facilitating universal health coverage (UHC), which since 2014 has been one of the eight Flagship Priorities for the Region. In fact, progress on all eight Flagship Priorities depends on access to quality diagnostic and laboratory services.

Given the recent COVID-19 pandemic and the need to prepare for future health emergencies, it is imperative that laboratory services in the Region are nationally coordinated, strengthened and enabled to make informed decisions. However, substantial challenges faced by the Member states remain. These include a) sustaining infrastructure, workforce and capabilities built over the years, in particular during the pandemic; b) integrating national laboratory networks for optimised efficiency; and c) strengthening national procurement, supply chain and regulatory processes.

The South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance addresses policy and technical issues for strengthening health laboratory services. It builds on past and current strategies such as the Asia-Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSEDIII) and the Asia-Pacific Strategy for Public Health Laboratories. The roadmap is interconnected with the Regional Strategic Action Plan for enhancing genomic surveillance for pathogens of pandemic and epidemic potential in the South-East Asia Region developed in April 2022 and aligns with the Regional Strategic Roadmap on health security and health system resilience for emergencies 2023-2027.

Besides it being an endeavour to raise awareness on the need to strengthen public health laboratory services, this document provides Member States a set of actions for building resilient and modernized national laboratory systems. This roadmap takes a comprehensive approach in strengthening diagnostic services and provides a guiding framework for Member States to align their policies and plans to enhance financial and technical support for health laboratory services.

The WHO Regional Office for South-East Asia encourages its Member States to use this document as a blueprint for providing comprehensive laboratory services, including the monitoring and evaluation of its performance at the national level and its associations with regional and global networks, to achieve better health outcomes for all.
Acknowledgements

The South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance was developed through a series of literature reviews, country interviews and regional consultations involving representatives from governments, global health organizations and donors.
### Abbreviations and acronyms

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<tr>
<td>AMR</td>
<td>antimicrobial resistance</td>
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<tr>
<td>APSEDIII</td>
<td>Asia-Pacific Strategy for Emerging Diseases and Public Health Emergencies</td>
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<td>CBRN</td>
<td>chemical, biological, radioactive and nuclear</td>
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<td>COVID-19</td>
<td>coronavirus disease 2019</td>
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<td>EDL</td>
<td>essential diagnostics list</td>
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<td>GLLP</td>
<td>Global Laboratory Leadership Programme</td>
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<td>JEE</td>
<td>joint external evaluation</td>
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<td>MERS-CoV</td>
<td>Middle East respiratory syndrome coronavirus</td>
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<td>PHSM</td>
<td>public health and social measures</td>
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<td>R&amp;D</td>
<td>research and development</td>
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<td>SARS</td>
<td>severe acute respiratory syndrome</td>
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<td>SEARO</td>
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<td>WHO Strategic Preparedness and Response Plan</td>
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Fig. 1. Voluntary joint external evaluation (JEE) of IHR (2005) Joint external evaluation data for national laboratories among eight countries (Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste) in the WHO South-East Asia Region (2016–2018)

Fig. 2. The WHO South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027

Fig. 3. Strategic Objectives to the WHO South-East Asia Regional Strategic Action Plan for genome surveillance for pathogens of epidemic and pandemic potential 2023–2027

Fig. 4. Conceptual design of the Regional Expert Laboratory Network

Fig. 5. Conceptual design of Regional Genome Consortium and key areas of prioritization at the national level
Executive summary

Access to diagnostics is the cornerstone for early warning, response and containment strategies and is essential for ensuring “health for all”. The COVID-19 pandemic has not only revealed and underscored the crucial need for timely and accurate diagnostics, but also highlighted that systemic problems remain in every aspect of the laboratory services and diagnostic ecosystem.

Within the WHO South-East Asia Region, despite progress towards strengthening laboratory capacity, substantial challenges remain. The requirements for laboratory core capacities under the International Health Regulations (IHR, 2005) have not yet been met in many Member States, and issues related to weak or non-existent regulatory frameworks for laboratory services, insufficient funding and inadequate access, quality of testing, equipment and supplies, and competence of the workforce, remain.

The WHO South-East Asia Regional Roadmap for Diagnostic Preparedness, Integrated Laboratory Networking and Genomic Surveillance was developed to provide Member States with collective guidance. The overarching goal of the Roadmap is to strengthen laboratory diagnostic preparedness for health security through enabling laboratories to rapidly, accurately and safely identify infectious and non-infectious hazards in a “One Health” approach, by improving multisectoral collaboration and partnerships.

The vision of the Roadmap calls for continuous efforts and investment towards advancing interconnected disease diagnosis and surveillance through resilient, quality assured, safe and timely laboratory services with efficient linkages to reporting, referrals and care. This vision will be achieved through six strategic objectives:

1. Strengthen national leadership, governance and multisectoral collaboration encompassing the broader “One Health” approach.
2. Ensure adequate investment to build and modernize clinical and public health laboratory networks.
3. Build agile and resilient laboratory policies and systems as an all-hazards approach.
4. Promote research, development of and access to new and innovative technologies.
5. Facilitate learning for continuous improvement and sustain readiness for public health emergencies.
6. Establish a trust architecture for rapid information and sample sharing, access to tools and resources to enable and strengthen pathogen surveillance and sequencing systems.

The Roadmap outlines a range of policy options that the Member States can use to develop sustainable strategies to improve their national laboratories and prepare the laboratory systems to improve surveillance and respond more effectively to emerging and re-emerging diseases, and other potential public health emergencies. Implementation of the Regional Roadmap will be imperative to increase investments in diagnostics and laboratory systems, support the development of new diagnostic tools, and ensure that national response systems are of adequate quality to prepare for and prevent or contain the next pandemic.
Introduction

In the first quarter of this century alone, the South-East Asia Region experienced several outbreaks of influenza A (H1N1), avian influenza A (H5N1), influenza A (H9N2), Nipah virus, Japanese encephalitis, Crimean–Congo haemorrhagic fever (CCHF), Middle East Respiratory Syndrome coronavirus (MERS-CoV), chikungunya, dengue, and severe acute respiratory syndrome (SARS), and prepared for a potential Ebola outbreak, before grappling with the latest SARS-CoV-2 outbreak that has caused the COVID-19 pandemic (1). But threats are not viral alone in nature, the pandemic has also accelerated the global crisis of antimicrobial resistance (2). Besides causing considerable morbidity, mortality and economic loss, these events have highlighted significant gaps in disease surveillance systems for early detection and response due to the limitations in clinical and public health laboratory capacities across the Member States.

Access to reliable, credible and sustainable diagnostics is the cornerstone for early warning, response and containment strategies and is essential for ensuring health for all (3). Given the growing emphasis on evidence-based health practices, it is imperative that diagnostics and laboratory services are strengthened to deliver early detection of pathogens, characterize epidemics, safely contain and prevent emerging and re-emerging diseases, and improve patient care.

Overview of regional capacities and lessons learnt during the COVID-19 pandemic response

The role of diagnostics has evolved throughout the COVID-19 pandemic from enhancing surveillance to guiding response strategies holistically. The inclusion of genomic sequencing as a key response tool highlighted its role as part of a continuum of laboratory-based services for surveillance, clinical management, primary research and other purposes.

Since January 2020, Member States have made concerted efforts to increase the regional molecular testing capacity from five laboratories providing confirmatory testing for SARS-CoV-2 to more than 5500 across the region as of June 2022. New diagnostic tools have rapidly been integrated into national testing strategies, with 10 Member States carrying out rapid antigen tests and all countries with confirmed cases of COVID-19 having access to genomic characterization facilities (in-country or external). Access to these diagnostics has led to early identification, prompt isolation and more effective treatment of COVID-19 cases. The testing strategies remained dynamic based on the local demands, changing landscape of transmission and ongoing relaxation of public health and social measures (PHSM), and were subject to high levels of pandemic fatigue.

A review of national policies and strategies and focused group discussions with the laboratory leadership in select Member States identified the major drivers for success of laboratory preparedness and response. Countries have benefited from preparedness activities through strengthening of laboratory capacities for pandemic influenza, vaccine preventable diseases and antimicrobial resistance (AMR). Leveraging of these existing resources was key to successful laboratory responses during the COVID-19 pandemic.

Global initiatives towards pandemic preparedness and disease surveillance programmes (such as with tuberculosis, HIV, malaria, measles–rubella and similar programmes) have collectively contributed to the overall strengthening of diagnostics systems in the Region. In particular, the Pandemic Influenza Preparedness Framework has made significant contributions to establish national laboratory systems for the identification of influenza viruses, which served as the first line of response for quickly setting up diagnostic capacity during the emergence of COVID-19 in the Region. It also prepared the platforms for national/international specimen transfers for testing and characterization, as well as related technical and technological exchange between countries.
Other significant drivers of success for laboratory preparedness and response were:

- Availability of national policies for governance, centralized coordination and multisectoral collaboration.
- Importance of scalability of testing and workforce ensuring surge capacities.
- Adaptability of testing strategies to changing transmission patterns.
- Rapid implementation of sequencing and analysis of capacity for rapid pathogen and variant identification.
- Impact of rapid sharing of information on public domains, including genomic data, for monitoring pathogen evolution to fast-track diagnostics, therapeutics and vaccine development.
- Need for differential diagnosis capacity across referral pathways from the community to tertiary levels of the health system.
- Role of testing outside the health-care system within schools, workplaces and during mass gatherings.
- Need for optimization of laboratory networks for efficient and effective delivery of services and response to health emergencies.

Despite massive scale-up of diagnostic capacity for SARS-CoV-2 by the Region, several challenges persist vis-a-vis the desired improvements to the pre-COVID-19 infrastructure before March 2020. The voluntary joint external evaluation (JEE) of IHR (2005) conducted in eight Member States (Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste) between 2016 and 2018 revealed several gaps in the areas of national laboratory systems and networking, biosafety/biosecurity and quality assurance (see Fig. 1).

**Fig. 1. Voluntary joint external evaluation (JEE) of IHR (2005) data for national laboratories among eight countries (Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste) in the WHO South-East Asia Region (2016–2018)**

<table>
<thead>
<tr>
<th>National laboratory system</th>
<th>D.1.1 Laboratory testing for detection of priority diseases</th>
<th>D.1.2 Specimen referral and transport system</th>
<th>D.1.3 Effective national diagnostic network</th>
<th>D.1.4 Laboratory quality system</th>
<th>P.6.1 Whole-of-government system in place for all sectors</th>
<th>P.6.2 Training and practices in all relevant sectors</th>
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<td>Biosafety and biosecurity</td>
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During the virtual Regional Meeting on “Learning from the COVID-19 response to strengthen health security and health systems resilience in the South-East Asia Region”, held on 20–22 October 2021, the major systemic gaps and challenges that hinder sustainability of laboratory systems and diagnostic capacities were identified. These challenges have contributed to significant delays in every aspect of outbreak response from initial detection to final containment both during and prior to the COVID-19 pandemic which include:

- Limitations in trained human resources, equipment maintenance and supply management.
- Infrastructural deficiencies for real-time monitoring of laboratory information flow and management systems.
- Lack of regulatory mechanisms for laboratory equipment and supplies.
- Varied interests and priorities of different stakeholders/partners/donors that are not coherent with local context.
- Sustained financials and commitments for developmental exercises during preparedness/inter-pandemic phases.
- Limited R&D for new diagnostic tools for priority pathogens during non-outbreak periods.
- Inadequate diagnostic testing capacity at both national and community levels of health care.
- Fragmented and unreliable funding pathways.

**Rational for developing the Regional Roadmap**

For diagnostics to play an optimal role within a broader health system, overall capacity strengthening through integration of laboratory systems into existing preparedness activities, disease surveillance programmes and health-care systems is critical. Novel strategic approaches are required for capacity strengthening and efficient data management systems, paving the way for resilient laboratory systems that complement the overall improvement of clinical care pathways and rapid detection of future outbreaks, and aid timely implementation of containment measures with the potential of saving many lives and substantially reducing the health-care burden. Resilience is needed in every building block of the laboratory services ecosystem.

While the laboratory and diagnostics services within the WHO South-East Asia Region were enhanced during the COVID-19 pandemic, the lessons learnt highlight the need for focused strengthening of certain key aspects to achieve sustainability and resilience of national laboratory systems.

To provide Member States with collective guidance, the national health authorities, the WHO Regional Office and a diverse group of international partners collaborated to develop a strategic roadmap for strengthening the laboratory services and integrating the networks. The roadmap outlines a range of policy options that the Member States can use to develop sustainable strategies to improve their national laboratories and bolster laboratory systems, improve surveillance and respond more effectively to emerging and re-emerging diseases and other potential public health emergencies.

This **WHO South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027** aims to address the existing gaps and challenges to efficiently and effectively strengthen diagnostic preparedness and laboratory systems at national and regional levels in collaboration with Member States and partners. It is the culmination of extensive literature review and consultations with representatives of Member State governments and development partners on identifying and agreeing on newer evidence, information and approaches that have emerged to build a future-ready diagnostics capability in the Region. The Roadmap is interconnected with the **Regional Strategic Action Plan for enhancing genomic surveillance for pathogens of pandemic and epidemic potential in the South-East Asia Region** developed in April 2022. It is also aligned with the **Regional Strategic Roadmap on health security and health system resilience for emergencies 2023–2027**.

The Regional Roadmap will build on past and current strategies such as the Asia-Pacific Strategy for Emerging Diseases and Public Health Emergencies (APSEDIII) and the Asia Pacific Strategy for Public Health Laboratories jointly developed by the Regional Offices for South-East Asia and the Western Pacific(4,5).
WHO South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027

Vision
Ensure that within the South-East Asia Region, continuous efforts and investments are made towards advancing interconnected disease diagnosis and surveillance through resilient, quality-assured, safe and timely laboratory services with efficient linkages to reporting, referrals and care.

Goal
Strengthen laboratory diagnostic preparedness for health security through enabling laboratories to rapidly, accurately and safely identify infectious and non-infectious hazards in a “One Health” approach, by improving multisectoral collaboration and partnerships, in the WHO South-East Asia Region.

Strategic Objectives
1. Strengthen national leadership, governance and multisectoral collaboration encompassing the broader “One Health” approach.
2. Ensure adequate investment to build and modernize clinical and public health laboratory networks.
3. Build agile and resilient laboratory policies and systems as an all-hazards approach.
4. Promote research, development of and access to new and innovative technologies.
5. Facilitate learning for continuous improvement and sustain the readiness posture for public health emergencies.
6. Establish a trust architecture for rapid information and sample sharing, access to tools and resources to enable and strengthen pathogen surveillance and sequencing systems.

Strategic approaches
At the Regional level
- Establish a diagnostic advisory group to prioritize diagnostic needs and develop pragmatic approaches to promote innovation to advance laboratory services for surveillance and clinical care.
- Support the strengthening of diagnostic availability across the health system through policies, governance and investment of sustainable laboratory systems.
- Establish a regional network to consolidate pathogen-specific expertise, diagnostic and surveillance capabilities and rapid information sharing mechanisms across disease networks and sectors.
- Establish regional mechanisms and best practices for rapid information and sample sharing for public health decision-making.
- Support the operationalization of the South-East Asia Regional Genomics Consortium to foster partnerships and collaboration across international borders to enable access to tools and resources, and information and biological samples.
- Foster collaborations with various stakeholders to promote a community of practice for peer-to-peer learning between Member States.
• Sustain technical and financial support for diagnostics, laboratory and surveillance systems strengthening.
• Establish partnerships to strengthen regional supply chain mechanisms for diagnostic tools, reagents and consumables.

At the country level
• Policymakers at the national level recognize the importance of strengthening diagnostics and laboratory systems for health security and universal health coverage as a cross-sectoral collaboration under the “One Health” approach.
• Advocate for and catalyse investment and resource mobilization towards multiyear strengthening of public health laboratories to improve emergency preparedness and response.
• Strengthen the links of public health laboratory systems with disease surveillance, risk assessment and effective public health decision-making under the “One Health” approach.
• Increase access to quality testing in clinical and public health laboratories across the health system.
• Strengthen sample referral and sample collection transport systems through the development of SoPs, capacity-building and leveraging the use of digital tools.
• Introduce diagnostic stewardship and strengthen linkages to clinical services for improved clinical management.
• Establish national quality assurance programmes and national biorepositories to catalogue samples for research and development and diagnostic test evaluations.
• Facilitate learning for continuous improvement of public health laboratories to enhance readiness for health emergencies.

Fig. 2. The WHO South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027
Priority activities to achieve Strategic Objectives

Strategic Objective 1: Strengthen national leadership, governance and multisectoral collaboration

- **Enhance political commitment to diagnostics and laboratory systems**
  National diagnostic roadmaps should be developed to build effective and sustainable diagnostics and laboratory systems in countries. The national roadmaps should be inclusive of existing plans such as the AMR national action plans, the national plans for Health Security, and the national laboratory policies. The strategies should be used to advocate with political leadership for continued support and investment to sustain national diagnostics and laboratory systems.

- **Enhance national leadership and coordination of laboratory services**
  Leveraging on the successes of the COVID-19 pandemic, countries should ensure that a dedicated national focal point or national technical working group is established to oversee and coordinate laboratory services across various sectors including but not limited to clinical services, public health services, private sector, the animal and environment sectors, and academia.

- **Develop an integrated national laboratory strategic plan including emergency planning to align resources from vertical and horizontal programmes**
  Based on the best practices and lessons learnt from the COVID-19 pandemic, countries should review and update the national laboratory strategic plans and relevant national policies to address and/or ensure: governance and coordination structures, multisectoral coordination, domestic and international partnerships, emergency preparedness and response planning, integration of new technologies, integration of surveillance and laboratory networks, quality assured and safe testing, harmonized regulatory processes, and resource mobilization to align resources for building effective laboratory systems.

- **Develop national policies for rapid information and sample sharing at national and international levels**
  Information and sample sharing is a critical element of an effective response to infectious disease outbreaks. National policies to facilitate rapid sharing at subnational, national and international levels should be developed adhering to international access and benefit sharing frameworks and legal instruments such as the International Health Regulations (2005). National mechanisms should also support and operationalize regional systems such as the WHO South-East Asia Genome Surveillance Consortium during public health emergencies.

- **Establish a package of laboratory services to be available across the health system**
  A package of clinical and public health laboratory services should be available to ensure that diagnostic testing is accessible at all levels of the health system. The development of national essential diagnostic lists (EDL), an evidence-based guide, can be used to plan for service delivery packages across the tiered laboratory networks and the health system. The EDL will help to improve resource allocation for diagnostics, laboratory systems and human resources leading to improved access and service delivery.
Strategic Objective 2: Ensuring adequate investment to build and modernize laboratory networks

• Develop focused, multiyear budgets to finance diagnostic and laboratory services
  To ensure sustainability and periodic improvement of laboratory infrastructure, data informatics, technical capacities and capabilities, an advanced workforce, and equitable access to laboratory services across the health system, a multiyear budget should be developed and be made available for allocation of domestic funds within the national health budget. It should be used for resource mobilization efforts with international and national partners. Collective action and a diversified investment strategy can support the right mix of diagnostic technologies, enhance workforce and sustain functionality. Private–public partnerships should also be established to identify new sources of funding. A monitoring and evaluation framework should be developed to review and reset investment priorities.

• Increased annual national spending on diagnostics and laboratory services
  Countries should demonstrate increased annual spending to improve and modernize laboratory infrastructure, data informatics and equipment and to strengthen the workforce for effective and efficient laboratory services.

• Improve diagnostic literacy, advocacy and communication strategies
  The work of science communicators during the COVID-19 pandemic was critical to reduce the impact of misinformation, encourage adherence to public and social measures and build trust in the national laboratory systems. National communication strategies must be developed to educate policymakers, health workers and the public on diagnostics and their uses. Use of behavioural communication and human-centred design studies are encouraged to understand the enablers and barriers to diagnostics from the perspectives of both the provider and end-user.

Strategic Objective 3: Building agile and resilient laboratory systems with an all-hazards approach

• Enhancing national laboratory networking for better preparedness to health emergencies as part of ‘One Health’ Approach
  The COVID-19 pandemic has demonstrated that a coordinated national laboratory network is critical to sharing early alerts, to rapidly scale a laboratory response with advanced planning for surge capacities, broadly validate new assays, provide consolidated data on quality and performance, and scale up the workforce. Existing and new collaborative relationships should be established between public health, clinical, animal, environmental, chemical, toxicology, radiation and the private sectors as well as academia as a platform for cross-country collaboration using the “One Health” approach. A tiered structure should be maintained and enhanced to increase connectivity between clinical and public health laboratories and include a package of services to be available across the health system. Efforts should be made to incorporate laboratory testing and confirmation across the health system through networks and sample referral mechanisms. National laboratory networks should also facilitate a community of practice on networking, quality management, disease surveillance, training and capacity-building and outbreak investigations.
• **Establish regional reference laboratory network and enhance readiness for public health emergencies (Annex C)**

A regional network of laboratories should be established and formalized. This should consolidate existing institutional and disease-specific expertise. The network shall provide guidance and set standards for detection of emerging pathogens with epidemic and pandemic potential, facilitate innovations in product development and evaluations, serve as a platform for cross-country collaboration, provide technical expertise, referral services and advanced characterization during public health emergencies, and lead in the development of research agendas. The regional network shall work in collaboration with existing pathogen-specific networks and stakeholders to advance interconnected surveillance and laboratory systems. Efforts should continue to strengthen and enhance capacities and capabilities of existing pathogen-specific networks.

• **Strengthen laboratory linkages to clinical services for improved diagnostic stewardship**

Increased efforts should be made to support the systematic utilization of laboratory testing through diagnostic stewardship. Tools, capacity-building and resources should be provided to introduce diagnostic stewardship that will ensure that the correct test is ordered on the right patient at the right time.

• **Foster a new cadre of laboratory workforce**

Laboratory leadership and management are necessary skills required for effective and efficient operation of laboratories. A national strategy and workplan should be developed for comprehensive training and retention of laboratory workforce including appropriate planning for surge capacities. Leadership programmes such as the Global Laboratory Leadership Programme (GLLP) should be implemented in countries to ensure that efforts are on to train and retain critical laboratory workforce. Efforts should also be made to embed necessary training within national training and academic programmes for long-term sustainability. National and regional mentorship programmes should also be established to improve core laboratory capacities in areas such as supply chain management, biosafety and biosecurity, and quality management. Continuous education and training should be provided to health-care workers and community health workers to recognise disease syndromes, standard notification procedures and information systems that will ultimately strengthen surveillance capacities.

• **Promote the generation, curation, analysis and use of laboratory data for evidence-based public health action**

Laboratory data has been critical to inform the development of medical countermeasures and risk-based decision-making related to a public health emergency, and to support the effectiveness of clinical interventions and operational efficiency of laboratory networks and surveillance systems. Efforts should be made to develop integrated and interoperable data systems and linkages to national systems through harmonization of existing data systems, building data management infrastructure and developing data-sharing policies and promoting the use of digital tools to improve laboratory services.
• **Link public health laboratories with surveillance and risk assessment**

Early warning systems are needed for the early recognition and identification of unusual disease syndromes. For this end, countries should support linkages of laboratories to surveillance and risk assessment functions. This includes strengthening roles of laboratories in event-based surveillance (immediate reporting of high-threat pathogens to public health systems), as well as indicator-based surveillance (to supplement case-based surveillance) through data-sharing related to vaccine-preventable diseases, AMR, zoonotic pathogens, food safety and unusual events.

• **Implement a comprehensive phased approach to quality management systems using evidence-based tools**

A comprehensive and phased approach promoting country ownership is required to assist countries to strengthen quality management systems. Efforts should be driven towards building national quality structures to improve monitoring, supervision, workforce development and licensing.

• **Further strengthen biosafety and biosecurity**

The recent publication of the evidence and risk based approach of the WHO Laboratory and Biosafety Manual (4th edition) allows countries to assess risks based on a case-by-case approach with regard to working with biological agents. Countries should rapidly implement the approach to develop sustainable laboratory biosafety and biosecurity policies and practices without compromising on safety.

• **Establish collaborations and linkages for laboratories and experts for chemical and radiation emergencies**

To facilitate the reduction of risks associated with chemical, biological, radioactive and nuclear (CBRN) public health emergencies and to ensure a coordinated response to them, countries should establish linkages to national networks and technical expertise for chemical and radionuclear hazards. Improved coordination with the public health sector can improve preparedness and response as an all-hazards approach.

**Strategic Objective 4: Promoting research and development of and access to new and innovative technologies**

• **Establish a regional diagnostic advisory group**

A dedicated group of regional experts with a broad range of expertise should be established to review and prioritize diagnostic needs for disease programmes, define the research needs for multisectoral disease surveillance, define diagnostic use case scenarios and target product profiles, and provide the SE Asia Region with technical advice on diagnostics and laboratory systems strategies. Periodic landscaping of diagnostic technologies and pathogen characterization technologies for use in laboratory and field settings should be undertaken to improve access, timeliness and efficiency of diagnostic and characterization activities. The group of experts will also be responsible for establishing partnerships to support funding, development, and validation and implementation of diagnostic tools and national laboratory systems strengthening.
• **Promote the development of national and regional biorepositories to facilitate sample sharing for research and development of medical countermeasures (Annex C)**

Access to specimen panels is a key challenge to rapidly developing quality diagnostics and medical countermeasures. Regional centres of excellence should be established to facilitate the sharing of clinical specimens for characterization and storage. Resources should be provided to countries to establish mechanisms for the standardized and ethical collection, characterization and archiving of specimens, and sharing these specimens for research development and evaluation for pathogens of epidemic and pandemic potential. Regional best practices for rapid sharing and characterization of clinical specimens during epidemic and non-epidemic periods should be developed based on global instruments and policies. Collaborations should be established through public–private partnerships with manufacturers for research and development and to facilitate technology transfer to scale up the manufacture of diagnostic tools.

• **Strengthen regulatory processes and frameworks**

Stronger collaboration and coordination are needed between public health laboratories and national regulatory authorities to ensure quality assurance of diagnostic tools. Training, protocols and funding should be made available to enhance regulatory system strengthening and implementation of vigilance and post-market surveillance. Country participation should be facilitated for regional initiatives such as the South-East Asian Regulatory Network (SEARN) to promote strengthening of regulatory practices and processes for medical devices and in vitro diagnostic tests.

• **Implementation research to identify gaps and challenges and provide solutions for laboratory systems efficiency and effectiveness**

Multiple challenges continue to persist that prevent the establishment of sustainable and resilient laboratory systems broadly affecting the diagnostic ecosystem from policies, supply chain management, capacity-building, workforce development and the implementation of new tools. Evidence-based approaches such as operational research should be conducted to identify barriers to optimizing laboratory systems for efficiency and effectiveness.

**Strategic Objective 5: Maintaining and sustaining readiness for public health emergencies**

• **Exercises to improve laboratory preparedness and response**

A package of tools, training materials and resources should be made available at national and regional levels to foster best practices and assess laboratory network readiness and ensure that the former are implemented to achieve the highest quality standards through active learning. Simulation exercises and after-action reviews should be conducted at national and subnational levels for ensuring readiness with demonstrated performance following a laboratory response, leading to context-specific plans to improve laboratory core capacities and indicators that will enforce and monitor rapid response.
• **Optimize laboratory network efficiency and performance**
  Advocacy, tools, training and resources should be provided to countries to effectively align testing strategies with demands during inter- and intra-pandemic periods to optimally utilize existing capacities in the most cost-effective way, exercise optimization for laboratory networks during the preparedness phase, and derive scalability to address surges.

• **Establish a monitoring and evaluation framework for health laboratory services**
  A standardized timeliness framework should be developed that measures functionality and performance metrics against global standards. The framework will measure the time taken to implement laboratory response activities allowing countries to identify challenges that can result in improvements in laboratory systems.

**Strategic Objective 6: Establish a trust architecture for rapid information and sample sharing, access to tools and resources to enable and strengthen pathogen surveillance and sequencing systems**

The Regional Roadmap has incorporated The WHO South-East Asia Regional Strategic Action Plan for genome surveillance for pathogens of epidemic and pandemic potential as its sixth strategic objective. The regional action plan addresses five strategic objectives (see Fig. 3) aligning to the WHO Global genomic surveillance strategy (6) to strengthen national surveillance and laboratory and information systems to integrate genomic surveillance into the wider public health architecture. The overarching goals of the Regional Action Plan are to:

1. develop a robust regional pathogen genomic surveillance system to detect and monitor SARS-CoV-2 and other pathogens of pandemic and epidemic potential; and
2. establish a trust architecture for rapid information and sample-sharing, and access to tools and resources to enable and strengthen pathogen surveillance and sequencing systems for pandemic preparedness and response.

To operationalize the Regional Action Plan, a Regional Genomic Surveillance Consortium for the WHO South-East Asia Region will be established to foster multidisciplinary collaboration to deliver an epidemic intelligence system that couples genomic data with data from multiple sources for risk assessment, preparedness planning and response decisions to manage pandemic and epidemic threats for health security. Ultimately the consortium will facilitate a broader scope of expanding the utility of genomic sequencing as a critical tool for preparedness and response to future health emergencies (see Annex C).

The inclusion of genomic sequencing as part of a continuum of laboratory-based services for surveillance and risk assessment has been critical throughout the COVID-19 pandemic and for other infectious diseases with epidemic and pandemic potential. Effective use of genomic information requires not only strengthening of genomic sequencing capacities, but also ensuring better linkages between laboratory and surveillance systems, including joint planning and other mechanisms for timely exchange of information. Countries should continue to participate in and contribute to initiatives such as the Regional Genomic Surveillance Consortium of the WHO South-East Asia Region to enhance regional collaboration and information-sharing for genomic surveillance and related risk assessment. The strategic objectives and actions of the WHO South-East Asia Regional Strategic Action Plan for genome surveillance for pathogens of epidemic and pandemic potential are summarized in Annex A.
Fig. 3. Strategic Objectives to the WHO South-East Asia Regional Strategic Action Plan for genome surveillance for pathogens of epidemic and pandemic potential 2023–2027

### South East Asia Regional Action Plan for enhancing genomic surveillance for pathogens of pandemic and epidemic potential (2023-2027)

- **Planning, coordination and monitoring**
  - Develop national action plan
  - Establish national coordinating body
  - Sustainability of genomic surveillance
  - Readiness and continuous improvement plans
  - Monitoring and evaluation

- **Tools and systems**
  - Enhance analytics systems
  - Optimized national genomic surveillance objectives and protocols
  - Accurate and sensitive laboratory systems
  - Map and monitor capability and capacity
  - Procurement and supply chain management

- **Enhancing workforce**
  - Establish regional training hubs
  - Retention of workforce
  - Communities of practice
  - Genomics and risk assessment of variants in training programme of field epidemiologists

- **Information sharing and connectivity**
  - Establish data and sample sharing and access principles
  - Establish regional standards for information and sample sharing
  - Targeted collaboration between academia, private sector and One-Health partners
  - Strengthen regional networking
  - Establish mechanisms for regional biorepositories

- **Risk assessment and decision making**
  - Strengthen national capacities for risk assessment
  - Tools for risk assessment
  - Regional and country capacities to characterize pathogens and variants
  - Regional mechanism for rapid sharing of information
  - Operational research

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**Monitoring and evaluation framework**

The Regional Roadmap will be implemented through complementary regional and country-level activities, and in cooperation between Member States, WHO, other United Nations Specialized Agencies, donors and development partners.

The monitoring and evaluation framework will be designed to enable a systematic and real-time understanding of implementation of this Regional Roadmap and its effectiveness to achieve the Strategic Objectives.
## Annex A: Strategic actions, activities and outcomes

<table>
<thead>
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<th>Objectives</th>
<th>Specific objectives</th>
<th>Activities</th>
<th>Outcomes</th>
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| **Strategic Objective 1:**  
Strengthen national leadership, governance and multisectorial coordination | • Enhance political commitment to diagnostics and laboratory systems | • Develop national strategies to improve clinical and public health diagnostics and laboratory services across the health system  
• Develop advocacy tools and initiatives to build political commitment  
• Develop position paper on the investment case for diagnostics | • Great political commitment to increasing accessibility and affordability of laboratory services |
| | • Enhance national leadership and coordination of laboratory services | • Establish unified national technical working group or multisectoral coordinating mechanism | • Clear national governance, leadership and coordination mechanisms in place and operational |
| | • Develop an integrated national laboratory strategic plan including emergency planning to align resources from vertical and horizontal programmes | • National strategic plans and contingency plans available for public health laboratory network  
• Improved linkage to national regulatory authority to harmonize processes  
• Contingency plans available for priority pathogens and other hazards including chemical, biological, radionuclear | • Improved laboratory preparedness and planning for health emergencies as an all-hazards approach |
| | • Develop national policies and legal framework for rapid information and sample sharing at national and international levels | • Review and update national policies for rapid sharing of information and specimens  
• Develop national MTAs | • Operational mechanisms and enabling legal framework in place for rapid information and sample sharing |
| | • Establish a package of laboratory services to be available across the health system | • Develop national essential diagnostic list and implementation framework  
• Map and strengthen domestic/indigenous production of diagnostic tools, reagents and consumables | • Improved allocation of tests and optimized use of laboratories  
• Decentralization of services through a coordinated national approach |
| **Strategic Objective 2**  
Ensuring adequate investment to build and modernize laboratory networks | • Develop focused, multiyear budgets to finance diagnostic and laboratory services | • Include budget for diagnostics and laboratory services within national health budget  
• Develop multiyear budgets for operationalizing and maintaining national public health laboratory and national networks and workforce  
• Develop resource mobilization plan with clear allocations and commitments for domestic and international funding | • Increase commitment and spending on diagnostic and laboratory services |
| | • Increased annual national spending on diagnostics and laboratory services | • Document spending and impact of investments on laboratory services | • Improved infrastructure, equipment and capabilities to detect pathogens of endemic and pandemic potential |
| | • Improve diagnostic literacy, advocacy and communication strategies | • National communication strategies in place  
• Capacity building workshops with media, clinicians, policy makers  
• Conduct research to understand enablers and barriers to diagnostics from both provider and end user perspective | • Improved awareness and trust in laboratory systems |
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<th>Specific objectives</th>
<th>Activities</th>
<th>Outcomes</th>
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| **Strategic Objective 3:** Building agile and resilient laboratory systems with an all-hazards approach | • Enhancing national laboratory networking for better preparedness to health emergencies as part of ‘One Health’ approach | • Develop a tiered national network with clear TORs, agreements for data and sample sharing and multisectoral engagement  
• Map existing laboratory assets and capacities at national level, including linkages between laboratories and structures of existing networks including expertise from zoonotic, environment, food testing, veterinary services  
• Develop policy, procedures and testing algorithms, including: roles and responsibilities inside the network; referral pathways; communication and sharing of information; monitoring of networking and workforce development  
• Establish community of practice of national laboratory network for peer-to-peer learning | • Integrated national laboratory networks ready to test and report results in a safe, timely and reliable manner for the detection of and response to disease outbreaks and other health emergencies |
| | • Establish regional reference laboratory network and enhance readiness for public health emergencies | • Develop criteria for the development of centres of excellence and WHO CCs to establish an integrated multi-pathogen expertise regional network  
• Develop workplan to enhance, harmonize and standardize infrastructure and testing capacities of regional network | • Multifunctional regional network incorporating institutional and pathogen specific expertise for the detection of and response to disease outbreaks and other health emergencies |
| | • Strengthen laboratory linkages to clinical services for improved diagnostic stewardship | • Provide continuous training to healthcare works to improve awareness and understanding of AMR  
• Strengthen data reporting mechanisms for rapid reporting | • Optimized use of diagnostics for clinical management  
• Optimized use of antimicrobial medicines and reduced incidence of AMR |
| | • Foster a new cadre of laboratory workforce | • Develop a national strategy for comprehensive laboratory workforce development  
• Establish GLLP training  
• Design processes and tools for the monitoring of training outcomes and impact  
• Provide training to health care workers including community health workers to recognize disease syndromes, standard notification procedures and information systems | • Increased workforce and improved staff retention  
• Rapid detection and reporting of unusual events |
| | • Promote the generation, curation, analysis and use of laboratory data for evidence-based public health action | • Conduct a review of laboratory data management systems  
• Develop strategy to integrate databases and reporting to centralized national centre | • Interoperable data management systems and reduced vertical structures  
• Clear country ownership |
| | • Link public health laboratories with surveillance and risk assessment | • Provide training to strengthen the roles of laboratories in event-based surveillance | • Improved risk assessment |
| | • Implement a comprehensive phased approach to quality management systems using evidence-based tools | • Provide training to strengthen national QMS  
• Develop plans strengthen quality management in private sector | • Improved quality testing |
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<th>Objectives</th>
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|                                                      | • Provide training to increase skilled workforce for quality management and supervision | • Provide training on LBM4  
• Conduct periodic audits to ensure effective implementation of biosafety and biosecurity protocols  
• Establish national policies to improve waste management across the national laboratory networks | • Risk-based approach to facility based biosafety risk assessments and improved staff health and well being |
|                                                      | • Further strengthen biosafety and biosecurity                                        | • Provide training on LBM4  
• Conduct periodic audits to ensure effective implementation of biosafety and biosecurity protocols  
• Establish national policies to improve waste management across the national laboratory networks | • Improved all hazards preparedness and increased access to infrastructure, equipment and workforce during public health emergencies |
|                                                      | • Establish collaborations and linkages for laboratories and experts for chemical and radiation emergencies | • Establish coordination and communication mechanism between public health laboratory network and chemical and radionuclear networks and experts  
• Map existing laboratory assets and capacities at national level, including linkages between laboratories and structures of existing networks | • Increased regional product development and stronger collaboration with academia, public health and industry  
• Timely and appropriate introduction of new diagnostic technology to maximize laboratory performance |
| Strategic Objective 4: Promote research and development of and access to new and innovative technologies | • Establish a regional diagnostic advisory group                                      | • Develop ToRs for the regional advisory group  
• Conduct periodic diagnostic landscapes to provide recommendations for updated testing strategies  
• Establish collaborations with private sector to improve market availability, support quality assured validations and uptake of new technologies | • Increased regional product development and stronger collaboration with academia, public health and industry  
• Timely and appropriate introduction of new diagnostic technology to maximize laboratory performance |
|                                                      | • Promote the development of national and regional biorepositories to facilitate sample sharing for research and development of medical countermeasures | • Develop criteria for establishing regional biorepositories with linkages to global initiatives such as WHO Biohub system  
• Develop national protocols standardized collection, characterization, and archiving of specimens  
• Develop regional mechanism to facilitate sharing and storage for evaluations | • Rapid development of reference materials and diagnostic evaluations during health emergencies |
|                                                      | • Strengthen regulatory processes and frameworks                                        | • Establish coordination mechanism between NRAs and PHL  
• Establish protocols for rapid evaluations of IVDs during emergencies  
• Develop protocols for post market surveillance and reporting | • Improved availability, quality of diagnostic tests and devices |
|                                                      | • Implementation research to identify gaps and challenges and provide solutions for laboratory systems efficiency and effectiveness | • Develop research agenda to address systemic challenges  
• Develop training on conducting operational research  
• Provide resources to increase regional publications  
• Design processes and tools for the monitoring outcomes and impact of research | • Reduced systemic challenges, efficient and effective laboratory networks and service delivery |
| Strategic Objective 5: Maintaining and sustaining readiness for public health emergencies | • Exercises to improve laboratory preparedness and response                          | • Conduct intra action and after-action reviews of laboratory responses  
• Develop user-friendly tools to monitor and assess laboratory responses during health emergencies | • Institutionalized learning and incremental improvements to laboratory responses to health emergencies |
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<td><strong>Specific objectives</strong></td>
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<tr>
<td>• Demonstrated utilization of models for improved service delivery</td>
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<td>• Optimize laboratory network efficiency and performance</td>
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<td>• Establish a monitoring and evaluation framework for health laboratory services</td>
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<td>• Strengthening planning, coordination and monitoring</td>
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<td>• Enhancing use of appropriate, effective and innovative technical tools and systems</td>
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<td>• Enhancing workforce for genomic sequencing and surveillance</td>
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<td>• Improving information sharing and connectivity</td>
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<td>• Strengthening risk assessment and decision making for public health action</td>
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<td><strong>Outcomes</strong></td>
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<td>• Optimized resources, improved supply chain management, effective utilization of equipment and improved planning</td>
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<td>• Improved benchmarks to monitor networking performance</td>
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<td>• Strong national leadership and unified strategy to integrate genomics into public health system</td>
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<td>• Enhanced access to and use of optimized, simple, interoperable and affordable tools and infrastructure</td>
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<td>• Establishment of an enhanced technical workforce that meets country needs to detect, monitor and respond</td>
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<td>• Enhanced information sharing of genomic and metadata and connectivity within and across the countries in the region and globally</td>
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<td>• Enhanced synthesizing of available information for risk-based decision making</td>
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Annex B: Regional Expert Laboratory Network

The Regional Expert Laboratory Network will also serve the function of the expert laboratories within the Regional Genomic Surveillance Consortium (Annex B). The Regional Expert Laboratory Network will consolidate existing technical and institutional expertise across disease networks.

The Diagnostic Advisory Group will work closely and collaborate with the regional network of expert laboratories to establish regional priorities, review the diagnostic technology landscape and engage closely with partners, donors and diagnostics developers.

*Fig. 4. Conceptual design of the Regional Expert Laboratory Network*
Annex C: WHO South-East Asia Regional Strategic Action Plan for genome surveillance for pathogens of epidemic and pandemic potential 2023–2027

Fig. 5. Conceptual design of Regional Genome Consortium and key areas of prioritization at the national level
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1. Emergency Risk Profile of the South-East Asia Region [Internet]. New Delhi: World Health Organization. Regional Office for South-East Asia; 2017. Available from: https://apps.who.int/iris/handle/10665/258766


Regional Strategic Roadmap for health security and health system resilience for emergencies 2023–2027

August 2022
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I. Foreword by the Regional Director

The global outbreak due to the severe acute respiratory syndrome (SARS) coronavirus in 2003 and the Indian Ocean tsunami in December 2004 are watershed events for global and regional health emergency management reform. The revision and subsequent endorsement of the International Health Regulations (IHR) 2005 to enable detection, reporting and containment at source of public health emergencies of international concern (PHEIC) was triggered by the SARS outbreak. The cluster approach and emergency funding through the United Nations Central Emergency Response Fund (CERF) were triggered by the Indian Ocean tsunami.

In addition to being an early adopter of these reforms, the WHO South-East (SE) Asia Region was an innovator, evidenced by the establishment of the SE Asia Region Health Emergency Fund (SEARHEF) and the development and implementation of standards for preparedness (South-East Asia Region Benchmarks for emergency preparedness and response) by the Regional Office.

The regional experience from responding to the pandemic of Influenza A H1N1 (2009) stressed the need to strengthen preparedness and response to emerging and re-emerging infectious diseases. Strengthening emergency risk management was thus declared one of the Flagship Priority Programmes of the SE Asia Region from 2014. The way the Nepal earthquake of 2015 was managed by the Member State, with regional and global support, showed that the emergency risk management initiatives and investments were bearing fruit.

In 2015, the Sustainable Development Goals with the inclusion of universal health coverage as one of the health targets, and the Sendai Framework for Disaster Risk Reduction 2015–2030, were adopted. The reforms of the WHO health emergencies portfolio were also initiated on account of the acknowledged gaps in responding to the 2014–2016 outbreak of Ebola virus disease in West Africa. These developments provided the background for formulating one of the Triple Billion goals of WHO’s Thirteenth General Programme of Work 2019–2023 to focus on protecting “one billion more people” from health emergencies.

Taking cognizance of the global reforms in health emergency risk management and the Rohingya crisis in Bangladesh and other emergency risks in the Region, the ministers of health of the Region’s Member States endorsed the Five-year Regional Strategic Plan to strengthen public health preparedness and response 2019–2023 and expressed the high-level political commitment through the Delhi Declaration on Emergency Preparedness in the South-East Asia Region of 2019. Enabled and motivated by these, Member States of the Region have progressed significantly in advancing core capacities mandated by the IHR 2005 for health emergency preparedness and response.

Now we are in the cusp of another momentous and essential course correction in the health emergency risk management architecture necessitated by the once-in-a-century global health emergency: the ongoing COVID-19 pandemic from 2020 onwards, which has caused untold suffering and unprecedented loss of lives and livelihoods, reduced life expectancies, eroded hard-earned health and developmental gains, stretched health and other critical systems to their limits, and unearthed and accentuated pre-existing global, regional and national inequities and fissures in the social fabric of communities the world over.
The intra-action reviews of the COVID-19 response undertaken by many Member States in 2020 and 2021 have unmistakably revealed that the levels of preparedness and response readiness that existed were not sufficient to effectively manage such a severe health emergency. The Seventy-fourth session of the WHO Regional Committee for South-East Asia in September 2021 recommended “further synthesis of the lessons learnt from the COVID-19 response at the regional level” and the “development of a Regional Roadmap to strengthen health security in the Region”.

This Regional Strategic Roadmap on health security and health system resilience for emergencies 2023–2027 is the result of rapidly taking the Regional Committee’s recommendation forward. It is based on distilling the lessons learnt from and recommendations generated for responding to the COVID-19 pandemic and other emergencies in the Region.

Regional-level consultations of representatives of Member States, development and technical partner agencies, and civil society organizations and experts were held in October 2021 to consolidate the lessons and recommendations and in June 2022 to discuss and provide feedback on the draft Regional Strategic Roadmap.

Global developments to strengthen pandemic and health emergency preparedness and response were also taken cognizance of to formulate the Roadmap. It is built on the experiences gained from the health security and health systems strengthening initiatives undertaken so far in the Region.

A companion document, called the South-East Asia Regional Roadmap for diagnostic preparedness, integrated laboratory networking and genomic surveillance 2023–2027, that specifically focuses on developing public health laboratory capacity at the national and regional levels has also been developed following a similar process as outlined above.

It is envisaged that Member States of the Region, supported by WHO and partners, will develop or revise and implement their national action plans on health security guided by these Regional Roadmaps to tangibly bolster health security capacity and build health systems that are resilient to emergencies through continued high-level political commitment, sustainable financing, effective intersectoral collaboration and robust multisectoral partnerships.

Let us learn from this pandemic and move forward together with hope and determination to build strong, sustainable, well-resourced and integrated health and other critical systems that are inclusive, equitable and coherent. Only such systems will help us reach our long-term goal of a regenerated planet with healthy and happy people, where everyone can realize their innate right to thrive, flourish and make valuable contributions to the common good.

Dr Poonam Khetrapal Singh
Regional Director
WHO South-East Asia
II. Abbreviations and acronyms

<table>
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<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tr>
<td>AAR</td>
<td>after-action review</td>
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<td>AEFI</td>
<td>adverse events following immunization</td>
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<td>AMR</td>
<td>antimicrobial resistance</td>
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<td>APSED</td>
<td>Asia Pacific Strategy for Emerging Diseases</td>
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<td>CCS</td>
<td>Country Cooperation Strategy</td>
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<td>CERF</td>
<td>Central Emergency Response Fund</td>
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<td>COVID-19</td>
<td>Coronavirus Disease 2019</td>
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<td>EB</td>
<td>Executive Board</td>
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<td>EOC</td>
<td>emergency operations centre</td>
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<td>ERM</td>
<td>emergency risk management</td>
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<td>EWARS</td>
<td>early warning, alert and response system</td>
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<tr>
<td>GGE</td>
<td>general government expenditure</td>
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<tr>
<td>GHE</td>
<td>government health expenditure</td>
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<td>GOARN</td>
<td>Global Outbreak Alert and Response Network</td>
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<td>GPW13</td>
<td>WHO Thirteenth General Programme of Work</td>
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<td>HAI</td>
<td>health-care-associated infection</td>
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<tr>
<td>HCWM</td>
<td>health-care waste management</td>
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<tr>
<td>HICC</td>
<td>hospital/health-care infection control committee</td>
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<tr>
<td>HLP</td>
<td>High-Level Preparatory (Meeting)</td>
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<tr>
<td>IAR</td>
<td>intra-action review</td>
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<tr>
<td>ICT</td>
<td>information and communication technology</td>
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<td>IHR</td>
<td>International Health Regulations (2005)</td>
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<tr>
<td>IHR-MEF</td>
<td>International Health Regulations – Monitoring and Evaluation Framework</td>
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<td>IHR-NFP</td>
<td>International Health Regulations – National Focal Point</td>
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<td>INB</td>
<td>Intergovernmental Negotiating Body</td>
</tr>
<tr>
<td>IPC</td>
<td>infection prevention and control</td>
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<td>JEE</td>
<td>Joint External Evaluation</td>
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<td>Mini-cPIE</td>
<td>COVID-19 Vaccination IAR</td>
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<tr>
<td>M&amp;E</td>
<td>monitoring and evaluation</td>
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<tr>
<td>MEF</td>
<td>Monitoring and Evaluation Framework</td>
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<td>NAPHS</td>
<td>National Action Plan on Health Security</td>
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<td>NFP</td>
<td>National Focal Point</td>
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<tr>
<td>Acronym</td>
<td>Description</td>
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<tr>
<td>PHC</td>
<td>primary health care</td>
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<td>PHEIC</td>
<td>Public Health Emergency of International Concern</td>
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<td>PHEP</td>
<td>public health emergency preparedness</td>
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<td>PHSM</td>
<td>public health and social measures</td>
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<td>PoE</td>
<td>point of entry</td>
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<td>PPE</td>
<td>personal protective equipment</td>
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<td>PPR</td>
<td>prevention, preparedness and response</td>
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<td>RCCE</td>
<td>risk communication and community engagement</td>
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<td>SARS CoV-2</td>
<td>Severe Acute Respiratory Syndrome Corona Virus-2</td>
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<td>SDGs</td>
<td>Sustainable Development Goals</td>
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<td>SEARHEF</td>
<td>South-East Asia Regional Health Emergency Fund</td>
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<td>SimEx</td>
<td>simulation exercise</td>
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<td>SOP</td>
<td>standard operating procedure</td>
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<td>SPAR</td>
<td>States Parties Annual Self-Reporting</td>
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<td>SPRP</td>
<td>Strategic Preparedness and Response Plan</td>
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<tr>
<td>UHPR</td>
<td>Universal Health and Preparedness Review</td>
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<tr>
<td>WaSH</td>
<td>water, sanitation and hygiene</td>
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<tr>
<td>WGPR</td>
<td>Working Group on strengthening WHO Preparedness and Response to health emergencies</td>
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<td>WHA</td>
<td>World Health Assembly</td>
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<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WoG</td>
<td>whole-of-government</td>
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<td>WoS</td>
<td>whole-of-society</td>
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III. Acknowledgements

The Regional Strategic Roadmap on health security and health system resilience for emergencies 2023–2027 was developed under the overall guidance of the Director of the WHO Health Emergencies Programme, by WHO Regional Office staff. Inputs from literature reviews, Member States’ self-assessments and joint external evaluations of IHR (2005) core capacities, intra-action reviews of COVID-19 response at country and regional levels, and reports of regional consultations, were used in its preparation. Experts and partners provided valuable guidance on the lessons learnt from the COVID-19 response. The Health Emergencies Department of the Regional Office expresses its gratitude to all individuals who actively participated in, helped organize content and contributed to the formulation of the Roadmap.
IV. Introduction and background

The International Health Regulations (IHR) 2005 call for the presence and functioning, throughout their territories, and specifically at the designated points of entry (PoE) of the Member States, core capacities that are required for surveillance, reporting, verification and notification of multihazard public health events or emergencies and for mounting the comprehensive public health response necessary to contain them at source.

The monitoring and evaluation (M&E) framework of IHR 2005 delineates the different core capacities that are needed, their components and the minimum requirements for ascribing the levels of development of these capacities. Through mandatory States Parties Annual Self Reporting (SPAR) after self-assessment and voluntary Joint External Evaluations (JEE) among other mechanisms such as the after-action reviews (AAR) and simulation exercises (SimEx), the Member State core capacity profile including the gaps are well-articulated. Member States utilize this profile to develop and implement National Action Plans on Health Security (NAPHS) to strengthen core capacities and ensure compliance to IHR 2005.

An adequate health system with well-developed and balanced building blocks and service provision arrangements, with high if not universal coverage, is not only foundational for health security but is also critical for (i) fulfilling the surge in demand for services that emergency response entails; (ii) continuity of essential services to the population impacted by the emergency; and (iii) the ability to bounce back to normalcy rapidly and stronger following an emergency – key characteristics of a resilient health system.

WHO, as the United Nations specialized agency for global health and the custodian of IHR 2005, is mandated to support Member States, guided by the Country Cooperation Strategy (CCS) in collaboration with the ministries of health – the national health system stewards, partners and stakeholders to enable health systems with an optimal level of service coverage, health security and resilience to multihazard emergencies. To discharge its mandate, the WHO Thirteenth General Programme of Work (GPW13) 2019–2023 envisaged addressing health security by targeting at least a billion more people better protected from health emergencies while simultaneously targeting to ensure that one billion more people benefit from universal health coverage (UHC) and a billion more enjoy better health and well-being.

To contribute to the achievement of the health emergencies target of WHO GPW13, the WHO South-East Asia Region has been implementing the Five-year Regional Strategic Plan to Strengthen Public Health Preparedness and Response 2019–2023, building on the ongoing efforts since 2014 through one of the Regional Flagship Priority Programmes to strengthen Emergency Risk Management (ERM). The regional strategic plan is based on and aligned to WHO’s Global Strategic Plan to improve Public Health Preparedness and Response 2018–2023 which was developed at the request of the World Health Assembly (WHA) in 2017.

The global and the regional strategic plans adopted a three-pillar approach to strengthen public health preparedness and response to emergencies – build, strengthen and maintain Member States’ core capacities required under IHR 2005; strengthen event notifications and management in compliance with requirements under IHR 2005; and measure progress and promote accountability in implementing the strategic plan. The regional strategic plan factored in the health security profiles of the Member States of the Region derived from the IHR-JEES undertaken by eight countries till 2018 and the IHRSPAR of 2018 completed by all 11 Member States.
Member States of the Region were making significant progress in building the IHR core capacities guided by the regional strategic plan as evidenced by the 2019 SPARs as also by the effective response to the public health emergencies that they faced in 2019 when suddenly they were impacted by the Coronavirus Disease (COVID-19) pandemic in 2020. While Member States with strong primary health care (PHC) oriented systems with capability for effective community and multisectoral engagement have been better able to respond to the pandemic, it has been revealed that the current level of preparedness for major health emergencies is not sufficient and a strengthened and resilient health system, incorporating multisectoral collaboration and a whole-of-society (WoS) approach is required at all Member States.

The COVID-19 pandemic has dramatically illustrated the impact of health emergencies not only on health but also on national economies and social welfare. Risks from natural and artificial hazards are also likely to result in major health emergencies of increasing frequency and impact given the weakened systems that the pandemic would leave in its wake coupled with the accumulating risk due to climate change. Cognizant of these ever-increasing risks and taking into consideration the lessons learnt from responding to the COVID-19 pandemic aided by the intra-action reviews (IAR), Member States, supported by all three levels of WHO and especially the regional and country offices and partners need to develop or update their NAPHS to strengthen the capacity to anticipate, prepare for and deal with future health emergencies.

The new Five-Year Regional Strategic Roadmap for Health Security and Health System Resilience for Emergencies 2023–2027 has been developed in a collaborative and participative manner. It has taken into consideration the global initiatives and developments to strengthen the pandemic and health emergency preparedness and response architecture, mechanisms, processes, global solidarity, and accountability. It is aimed to serve as guidance to the Member States of WHO South-East Asia Region in their efforts to strengthen national health security and health system resilience for emergencies and contribute to the consolidation of the collective, supportive, and augmenting capacities needed at the regional level.

The structure and content of the Regional Strategic Roadmap is also envisaged to assist Member States to swiftly outline the Strategic Preparedness and Response Plans (SPRP) needed to manage emergencies caused by specific hazards – especially infectious. It also outlines approaches for implementing the strategy at national level in the context of national systems, norms, and capabilities. A framework to ensure accountability for implementation of the roadmap that is aligned to the existing M&E framework for IHR 2005, health systems performance and Sustainable Development Goals (SDGs), etc. that would not place additional data generation and reporting burden on countries is also proposed.
V. Rationale for developing the new Regional Strategic Roadmap, its purpose and utility

Though the Five-Year Regional Strategic Plan to strengthen preparedness and response (2019–2023) for the South-East Asia Region would need to close in 2023, the COVID-19 pandemic which commenced in 2020 and is ongoing has (i) prevented the entirety of the plan from being implemented as envisaged; and (ii) thrown up challenges and lessons that necessitate early curtailment of the strategic plan. This calls for the formulation of a new strategic roadmap for the Region that incorporates the lived realities of the Member States and the lessons learnt and the related global developments.

The Seventy-fourth session of the WHO Regional Committee for South-East Asia held in September 2021 has recommended WHO to facilitate further synthesis of the lessons learnt from the COVID-19 response and work with Member States to develop a regional roadmap to strengthen health security in the Region. In compliance with this recommendation, a virtual regional meeting on “Learning from the COVID-19 response to strengthen health security and health systems resilience in the WHO South-East Asia Region” was held in October 2021 and attended by nine Member States, partners and selected experts from the Region. Through this meeting, key lessons learnt were captured and consolidated under 12 technical areas. Key recommendations from this meeting include further synthesis of lessons and informing reform and investment for more effective health security systems and health system resilience which is more oriented towards PHC, and contribution to upgrading the global and regional health security framework.

At the global level, the Working Group on strengthening WHO preparedness and response to health emergencies (WGPR) was established with a mandate derived from the World Health Assembly resolution WHA74.7 (2021) and by decision WHA74(16) (2021). The WGPR submitted its first report, which was adopted by consensus by the WGPR and welcomed at the World Health Assembly at its second special session (29 November–1 December 2021). This led to the formation of the Intergovernmental Negotiating Body (INB) to draft and negotiate a WHO convention, agreement or other international instrument on pandemic prevention, preparedness and response (PPR).

The WGPR made concrete recommendations to the Seventy-fifth World Health Assembly held from 22–28 May, for the thematic areas of political leadership, financing (national, regional and global levels including for WHO), strengthening IHR implementation, compliance and potential amendments and equity. The Seventy-fifth World Health Assembly approved the recommendations made by WGPR, changed the overall mandate of WGPR and renamed it as the Working Group on IHR which will work in close coordination with the INB. The 151st Executive Board of WHO has also approved the formation of a standing committee on health emergency preparedness and response which will have 14 members (including two from each region). The terms of reference of this standing committee are being finalized and the committee meeting is scheduled for October 2022. These global developments also entail the formulation of a new Regional Strategic Roadmap.

At the High-Level Preparatory (HLP) Meeting for the Seventy-fourth Regional Committee for South-East Asia, WHO was requested to continue supporting Member States in responding to the ongoing pandemic while strengthening the delivery of essential health services through accelerating progress on the Regional Flagship Priorities related to UHC and health emergencies. The linkages between the two Flagship priorities should also be strengthened, such as facilitating identification of priority actions to enhance resilience of health systems through COVID-19 IARs and their inclusion in the Regional Strategic Roadmap.
The South-East Asia Region Health Ministers’ Declarations on “Collective Response to COVID-19” at the Seventy-third and Seventy-fourth sessions of the Regional Committee on “COVID-19 and Measures to Build Back Better” highlighted the importance of investments in PHC as the foundation for effective response to public health emergencies, strengthening of IHR core capacities and the achievement of UHC and the health-related SDGs. The new Regional Strategic Roadmap will be a vital vehicle for the realization of these declarations.

In practical terms, the roadmap is structured, and its contents detailed to assist Member States to develop or update and implement their NAPHS for strengthening the capacity to anticipate, prepare for and deal with future health emergencies by readily outlining the SPRP, which are needed to manage emergencies caused by specific hazards – especially infectious. The new roadmap is expected to further accelerate the implementation of the Delhi Declaration – Emergency Preparedness in the South-East Asia Region (2019) and inform development of future health security frameworks in the Region and inform our collective efforts towards a safer and more secure Region.
VI. Overview of IHR core capacity status and interventions to enhance capacity in the region

Despite challenges including the COVID-19 pandemic, Member States of the Region have made considerable progress in building the core capacities for complying with the IHR 2005. Countries have fully utilized existing core capacities to respond to the unprecedented ongoing pandemic to control transmission and save lives. However, the COVID-19 pandemic has revealed that the current level of preparedness is not sufficient to effectively manage severe health emergencies such as this pandemic. The Region adopted the International Health Regulations – Monitoring and Evaluation Framework (IHR-MEF) to measure progress, enhance accountability and foster continuous learning and improvement and to report annually on the progress in strengthening IHR capacities through enabling countries to implement NAPHS.

The 2021 round of the SPAR was submitted by all 11 Member States in early 2022, maintaining the 100% response rate observed in the Region since 2016. The newly introduced revised version of SPAR 2021 captured 15 capacities and 35 indicators compared to 13 capacities and 24 indicators in the first edition, which was used from 2018 to 2020. As per the 2021 SPAR, five Member States of the Region reported an average score of 41–60%, four an average score of 61–80% and two an average score above 80% for the 15 core capacities.

The lowest score was reported for policies for chemical events management followed by legal and normative instruments to manage emergencies, and capacities to address food safety and radiation emergencies. The highest average score was observed for surveillance capacity followed by risk communication capacity and health emergency management – all three of which have benefited by their augmentation for COVID-19 response.

Table 1. SPAR 2021 of Member States of the WHO South-East Asia Region

<table>
<thead>
<tr>
<th>Countries</th>
<th>Policy, legal &amp; normative instruments</th>
<th>Communication &amp; IHR functioning</th>
<th>Financing</th>
<th>Laboratory</th>
<th>Surveillance</th>
<th>Human Resources</th>
<th>Health Emergency Management</th>
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Regional average scores were lower than the global average in the capacity areas of policy; legal and normative instruments; laboratory; infection prevention and control (IPC); zoonotic diseases; food safety; chemical events; and radiation emergencies. Multisectoral involvement in responding to the SPAR questionnaire for quality assessment of capacities, and utilization of SPAR data for health sector planning and IHR capacity enhancement have been observed over the years.

Eight Member States – Bangladesh, Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste – have conducted the voluntary JEE between 2016 and 2018. JEEs planned in 2020 and 2021 were postponed due to the COVID-19 pandemic. The JEE tool has been revised based on the lessons learnt from the COVID-19 pandemic and recommendations from technical consultative meetings. The regional overview of IHR capacity over 19 technical areas as per the eight JEE conducted so far reflects significant progress in areas of national legislation, policy and financing; IHR coordination, communication and advocacy; immunization services; laboratory capacity, surveillance and reporting and risk communication.
However, the national focal points (NFPs) across the Region need to improve capacity in certain areas with more impetus and investments in emergency preparedness and response readiness to deal with any unexpected chemical or radio-nuclear emergency, enhancing biosafety and biosecurity in laboratory networks to curb increasing antimicrobial resistance (AMR) due to weak or improper medical countermeasures; delayed personnel deployment to manage emergencies; and improving prevention and control of disease transmission at the PoE.

Many Member States of the Region have conducted SimEx to test the functional response capacity to COVID-19 including COVID-19 vaccine drills. Several Member States used the WHO SimEx packages for COVID-19 before implementing their COVID-19 vaccine programmes and response activities. Many countries have also conducted AARs after varied public health emergencies for examining the response and to learn lessons for improvement to prepare for and manage future emergencies.

Long before COVID-19, the Region has prioritized the strengthening of preparedness and response through the South-East Asia “Regional Flagship Priority 6: Scaling up of capacities in Emergency Risk Management”. Since 2016, WHO has been working closely with Member States and partners to support the development of NAPHS to accelerate the implementation of interventions to enhance IHR core capacities and is based on a One Health and whole-of-government (WoG) approach for all hazards. The development and updates of the plans have been informed by data from the four components of the IHR-MEF and other internal assessments.

Following the IHR assessments, seven Member States – Bhutan, Indonesia, Maldives, Myanmar, Sri Lanka, Thailand and Timor-Leste – have developed and implemented the NAPHS, while Bangladesh was awaiting endorsement of its NAPHS. The plans are aligned with the national health sector plans linking activities using a “One Health approach” and encompass broader health system strengthening with full government and societal involvement.

Strengthening IHR core capacities through progressive implementation of NAPHS not only improves national health security, but also safeguards travel and trade, and helps to protect economic and social development. The operationalization of NAPHS in the countries has been challenged by competing priorities between health and non-health sectors, governance, political commitment and sustainable financing. Intersectoral cooperation and adequate financing is necessary for the sustained implementation of NAPHS. As a significant achievement, the “preparedness stream” of the South-East Asia Regional Health Emergency Fund (SEARHEF) was set up in 2016 for catalysing interventions prioritized in NAPHS.

Strengthening International Health Regulations – National Focal Point (IHR-NFP) capacities remains a high priority for the Region. Even during the pandemic, virtual IHR-NFP meetings were conducted periodically to share the best practices in COVID-19 response among the Member States as well as to provide updates on the prevailing epidemiological situation, innovative approaches in COVID-19 response and latest technical guidelines. In addition, the Regional IHR Knowledge Network has served as a common online platform for informal sharing of information, experience and good practices and peer-to-peer learning between NFPs and experts as well as for conducting online capacity-building webinars and hosting virtual meetings.

Recently, the Universal Health and Preparedness Review (UHPR) has been introduced and is being piloted to build mutual trust and accountability, by bringing Member States together as neighbours and strengthening national capacities for health emergency preparedness, UHC and healthier populations. The first pilot of the UHPR in the Region has been conducted in Thailand in April 2022.
VII. Summary of key findings from intra-action reviews of COVID-19 response; lessons learnt and recommendations

The COVID-19 pandemic has brought unprecedented social and economic disruptions globally, while cases and deaths have soared. As the acute, initial phase of the COVID-19 pandemic and response to it around the world moved into a protracted phase, there was a need to conduct periodic reviews of the COVID-19 response while the emergency is ongoing to identify opportunities to further strengthen country emergency preparedness and response capacities and course correct the response as needed.

IARs provide a unique opportunity to bring all stakeholders together from different parts of the government, private sector and civil society to collectively reflect on their response, identify best practices, challenges, lessons learnt and come up with immediate and mid- to long-term recommended activities to continually improve their COVID-19 preparedness and response, which also have a bearing on overall ERM.

In the South-East Asia Region, Bangladesh, Bhutan, India (Gujarat), Indonesia, Nepal, Sri Lanka and Thailand have reported on the multi-stakeholder IARs of COVID-19 response that they have conducted. Indonesia has also conducted six follow-up monitoring meetings periodically to monitor the implementation of the recommendations that emerged from the IAR. Some Member States have also conducted COVID-19 vaccination IARs (Mini-cPIE) to document the good practices and identify challenges that were faced during the vaccination roll out. Bringing stakeholders from different sectors together to engage in a productive dialogue about the pandemic response has also been emphasized as being of direct benefit for corrective actions through collective efforts. The findings and recommendations have important implications for strengthening national health security systems.

Building these regional and national health security systems require long-term vision and committed political leadership to provide direction and ensure sustainable financing. Member States, WHO and other partners worked together to identify the key learnings and gaps from the COVID-19 response to more effectively respond to the ongoing pandemic and prepare for future pandemics and other emergencies. Priority actions to further strengthen health security and health system resilience based on the lessons learnt were also identified.

The Seventy-fourth session of WHO Regional Committee for South-East Asia, held in September 2021, recommended “further synthesis of the lessons learnt from the COVID-19 response at a regional level” and “to develop a regional roadmap to strengthen health security in the South-East Asia Region”. Responding to these recommendations, WHO Regional Office for South-East Asia organized meetings with experts and with Member States and partners in October 2021.

Through the regional meeting, delegates of the Member State shared crucial lessons across 12 technical areas – 10 technical areas as per the WHO SPRP for COVID-19 plus two additional technical areas.
SPRP Pillar 1: Coordination, planning, financing and monitoring

High-level, multisectoral leadership that fosters a WoG and WoS response, a strong incident management system, legislation, functional emergency operation centres, and accountability framework are crucial. Strong investments in health security over the years including public health infrastructure returns with efficient and effective response to emergency. A more diverse workforce needs to be mobilized and private sector involvement has helped enable a strong multisector response. Learning, such as through IARs, informs continuous improvement of response.

SPRP Pillar 2: Risk communication, community engagement and infodemic management

A functional national action plan and standard operating procedures (SOPs) including coordination mechanisms for proactive and responsive communication are very important. Strong leadership and active communication using a single set of information from the government with appropriate use of local languages was particularly important in the evolving science of a new disease. Listening to and engaging with communities, key influencers and tackling misinformation and disinformation should be strengthened through multi-stakeholder engagement including the private sector.

SPRP Pillar 3: Surveillance, epidemiological investigation and contact tracing

Existing surveillance systems at the subnational level and field epidemiology training programmes provided an important foundation. More systematic synthesis of multiple information sources for risk assessment as well as decision-making and having a workforce plan including for surge capacities are priorities. Capacities at the district and PHC levels for surveillance were considered critical. Multiple platforms and infrastructure for reporting mechanisms need to be strengthened.

SPRP Pillar 4: Points-of-entry, international travel and transport, and mass gatherings

Multidisciplinary technical and operational support, improved multisectoral coordination, partnerships and risk-based approach are priorities for efficient and safe mobility management at PoE with capability to rapidly surge. Regular risk assessment, infrastructure investment, digitalization and harmonization with national surveillance system at PoE, and strengthening cross-border collaboration and information sharing are critical priorities.

SPRP Pillar 5: Laboratories and diagnostics

Existing national policies and laboratory systems positively contributed to the enhanced response. Investments in laboratory capacity enabled quick development of diagnostic tools and capacity for COVID-19 testing and the expansion of the coordinated COVID laboratory network. Formalizing workforce surge mechanisms, digitalizing laboratory reporting platforms and establishing a Diagnostic Technical Advisory Group at the national and regional levels, including strengthening collaborative platforms for genomic surveillance, were also recommended to develop and strengthen the laboratory system and diagnostics through concerted efforts.
SPRP Pillar 6: Infection prevention and control

An integrated national IPC strategy, guidelines and a national programme that includes surveillance for hospital/health-care-associated infections (HAIs), through adequate training of health personnel and volunteers, is crucial to guide IPC implementation. Integration of IPC with safe water, sanitation and hygiene (WaSH) at health facilities, and efficient health-care waste management (HCWM) would serve as the base for enhanced response during an emergency. Timely and sustained supplies of personal protective equipment (PPE) and stockpile need to be ensured for equity in pandemic countermeasures.

SPRP Pillar 7: Case management, clinical operations and therapeutics

The capacity to scale up health-care systems through mobilizing surge staff (both health and non-health) of diverse skillsets and ensuring compliance with rapidly changing guidelines and referral procedures were critical. Improved access to real-time data is needed to support evidence-based decision-making. Adaptable care pathway, referral mechanisms, and coordinated continuum of prehospital, acute/hospital, post-acute and rehabilitative care is needed. Private sector involvement is foundational for pandemic surge response in many Member States. Community-based and home-based care models supported by home visits and telemedicine made important contributions and good civil–military cooperation also played a crucial role in effective health-care management.

SPRP Pillar 8: Operational support and logistics and supply chains

Significant disruptions and increased demand for essential goods posed major challenges. Logistics reporting system with facilitated information sharing and supply management between the subnational and national levels and emergency funding for health-care infrastructure, logistics and procurement needs to be strengthened. Global shortages and non-availability of resources delayed procurement and logistics services when demand for essential goods increased for efficient countermeasures. Better financing; strengthening public–private partnerships; establishing subnational emergency logistic warehouses, national and regional stockpiles, and local manufacturing capacities; contingency plans for supply chain management; and real-time logistic information management systems were identified as critical needs.

SPRP Pillar 9: Maintaining essential health services and systems

Innovative mechanisms to maintain health services and access were adopted, such as telemedicine, home delivery of treatment, volunteerism, and multi-month dispensing. Evaluation of best practices and regulatory framework for new service delivery models are needed. National programmes with contingency plans and tested modalities for maintaining services during emergencies were able to adapt global tools more efficiently during the pandemic.

SPRP Pillar 10: Vaccination

High-level political commitment, multisectoral oversight bodies, a vaccine deployment plan, and mechanisms to expedite emergency use authorization were key factors for success. Ensuring risk communication and community engagement (RCCCE) to address vaccine demand issues and hesitancy, systems to facilitate evidence-based corrective actions, and functional adverse events following immunization (AEFI) surveillance are critical needs.
Technical area – public health and social measures (PHSM)

Multisectoral processes that use a WoS approach, with community engagement and two-way listening, were crucial to ensure effective PHSM. A risk-based approach for calibrating PHSM at the subnational level is required to timely adjust the response measures.

Technical area – resilient health system

Enhanced investments in PHC-oriented health systems that fully engage communities are a priority. Mechanisms to mobilize surge staff, engaging private practitioners during an emergency, while ensuring continuity of health services, are needed.

The consultations with the Regional Director’s expert working group also identified policy and system enablers for more effective preparedness, response and resilience.
PHC-oriented resilient health systems

PHC system, including community health-care workers, have vital roles in the pandemic response. Long-term investment and early engagement enhance their effectiveness. Mechanisms to mobilize surge staff, engaging private practitioner, is needed. The availability of business continuity plans informed by experiences in managing previous emergencies helped rapid adaptation.

- **Public and private partnerships:** More effective engagement of the private sector has major potential to improve pandemic response, from provision of health care, production of pandemic products, logistic and supply management to risk communication.

- **Digital technology for surveillance and response:** Digital and information technology should be further applied to improve surveillance, data management, contact tracing, care, and treatment (telemedicine) and planning for PHSM and vaccination.

- **Psychosocial care and support:** Mental health and psychosocial services should be an integral part of emergency response from the very beginning of any health emergency. The roles of partners have been critical to reach vulnerable populations and to address range of psychosocial issues.

- **Regional platform for alert, preparedness and response:** The mechanisms for regional surveillance and timely information-sharing across countries of the Region must be improved. Regional stockpiling and supply chain systems should be explored and established.

- **Local manufacturing and equitable access to emergency products:** More robust mechanisms for equitable distribution of emergency products are crucial. Strengthening of local manufacturing capacities for quality-assured pandemic products within the Region may need to be explored.

Lessons from the COVID-19 pandemic response confirmed and augmented the repeated lessons from other emergencies in the Region and clearly stressed the need for ERM that is broad-based, utilizing the WoG and WoS approach to engage relevant stakeholders beyond the health sector.

This demands collaboration, mutual accountability and concerted actions between national leaders, policymakers, local governments, academia, professional associations, civil society organizations and global initiatives for the effective implementation of NAPHS, including securing human resources with multiple skillsets and domestic financing.

An enabling environment for NAPHS implementation through international cooperation and partnerships also plays a crucial role in the Region to strengthen health security and health system resilience to emergencies by augmenting IHR core capacities and enhanced development of the health system building blocks to improve UHC and ensure effective and efficient services needed by people across the life course.
VIII. Process of development of the new Regional Strategic Roadmap

A draft Regional Strategic Roadmap was prepared by the WHO secretariat at the regional level and was deliberated upon at a regional meeting conducted in a hybrid mode on 29–30 June and 1 July 2022.

The feedback and outputs from the regional meeting were used to finalize the draft strategic roadmap along with the approaches to operationalize the roadmap and to monitor and evaluate its implementation.

The finalized Regional Strategic Roadmap was shared during the HLP Meeting in July 2022 for consultation, consideration and updating using the feedback provided.

The HLP delegates recommended that the updated Regional Strategic Roadmap be tabled before the WHO Regional Committee for South-East Asia at its meeting in September 2022, to be considered and endorsed for implementation.
IX. The new Regional Strategic Roadmap for Health Security and Health System Resilience for Emergencies 2023–2027

IX.1. Strategic vision

People and economies in the WHO South-East Asia Region are protected from the impact of public health emergencies.

IX.2. Goal

To strengthen national and regional health security and health system resilience, to anticipate, prevent and manage health emergencies while maintaining essential health services, through enhanced health systems, governance and collaboration within and across the countries of the Region.

IX.3. Strategic objectives

i. Strengthen the whole of government and whole of society approach to enable more effective public health emergency preparedness (PHEP), readiness and response.

ii. Strengthen country health security systems to reduce risks, anticipate, detect early, prevent and respond to public health emergencies as well as recover from their impact.

iii. Strengthen governance, financing and enabling functions and health system resilience for emergency preparedness and surge response.

iv. Strengthen health system resilience to enable continuity of essential health services.

v. Strengthen regional alert, preparedness and response systems, through improved regional collaboration.

IX.4. Key principles

i. Response to all hazards, including health emergencies will require strong leadership and coordinated action from different sectors. Therefore, this strategy is founded on a multisectoral, multidisciplinary, risk-based, all hazard approach, guided by strong leadership.

ii. Prevention, control, and impact reduction of all hazards is possible only through collaboration with communities, and the most vulnerable people – who are more susceptible to their impact – must be protected.

iii. Member States must be able to anticipate and respond to all hazards adequately as the cost of economic and social disruption far exceeds the cost of preparedness and early response.

iv. WHO has to act as the knowledge partner to synthesize existing knowledge, provide technical support and facilitate collaboration between Member States.
IX.5. Elements/sections of the Regional Strategic Roadmap

The elements/sections of the strategic roadmap are organized around three focus areas:

A) strengthen the capacity of Member States to quickly detect and respond to all hazards;
B) guidance on the steps to be taken during the public health emergency to reduce its spread to wider geographies and populations and reduce the impact on them; and
C) regional and global initiatives and linkages.

5. A. Strengthen the capacity of the Member States to detect, control and mitigate the impact of emergency risks

During an emergency, systems which are prepared and have depth in capacity are able to cope better. These capacities have to be built before the hazard occurs and the emergency sets in. For this, Member States, supported by WHO, need to envision different types and scale of risks, and plan to prepare for them. This is cost-effective considering the potential impact of emergencies and the beneficial impact on everyday resilience to maintain quality of living.

The objectives of this focus area are to strengthen systems for early detection, control and mitigating the impact of any hazards that may arise in future, using lessons learnt from the experience of managing past emergencies in the Region. The core strategies may be categorized as: leadership and finance, information, public health systems, systems for providing health care, community engagement and enabling systems.
5.A.1. Leadership and finance

1.1. Leadership is the lynchpin of an effective response to all hazards

The value of leadership, from the national to local implementation level, in managing all risks was demonstrated during many disasters and emergencies in the past including COVID-19. In addition to strong and visible leadership at the national level, Member States need to have systems to nurture leaders including IHR-NFP at all levels and ensure they have adequate resources and administrative powers to implement their mandate. This can be done within the current regulatory and administrative framework, by strengthening existing mechanisms to achieve this objective. Member States need to ensure that:

a. Preparedness, readiness and response capacities to cope with all hazard emergencies are elevated to the level of heads of state and government to ensure sustained political commitment for a WoG and WoS approach, to make the required resources available and facilitate the regulatory and administrative changes needed to respond to health and other emergencies. Programme managers at various levels are trained on the national vision, values and strategies to respond at their levels and are delegated the authority to mount an emergent response appropriate to local needs.

b. Multihazard response plans and procedures are put in place that clearly define the roles, responsibilities, systems and mechanisms for initiating and managing an emergency response, using a multisectoral risk management approach. Disease outbreaks and other health emergencies are integrated effectively in multisectoral policies, actions and practices, such as national disaster risk reduction strategies.

c. Strengthen the IHR-NFP with credibility and operational reliability through proactive communications with key stakeholders at all levels across all sectors and establish mechanisms for providing and receiving feedback within IHR-NFP and among relevant stakeholders with shared vision, responsibility, accountability and credibility.

1.2. Creating a regulatory and administrative framework for managing emergencies

Managing emergencies must be backed by regulatory and governance frameworks to empower authorities to take appropriate measures and ensure that prevention does not lead to violation of civil rights.

To ensure this Member States should:

a. Frame or strengthen acts and rules to prescribe and regulate the measures needed to manage hazards and designate entities empowered to act based on them. Since restrictions can create economic and social hardships, they must be communicated to the community before emergencies occur.

b. Institute regulatory controls for managing institutions in the public and private sectors, which must be involved in managing the emergency, including health-care institutions and agencies providing such needed items as earth-moving equipment, transportation systems and plants for providing clean water.

c. Strengthen existing structures and mechanism to optimize collaboration and regulation with the private sector, civil society organizations, nongovernmental organization, community-based organization, influencers and academic institutions to facilitate their participation in managing emergencies.
d. Develop a set of regulations which become applicable during emergencies to fast-track licensing of diagnostic kits, drugs and vaccines and emergency accreditation of workforce and facilities as per the national policy and norms.

e. Prescribe exceptional administrative and financial practices that are to be used during times of emergency and define the conditions under which these would be activated.

1.3. Mobilize additional financial resources for strengthening systems and coping with emergencies

Additional finances are required for strengthening systems as part of all risks preparedness and to respond to emergencies when they occur. These require two different mechanisms: financing preparedness can be integrated into annual budgets over a medium time period while emergency response will need sudden infusion of resources. The provisions of public finance mechanism and systems for resource mobilization from the private sector and partner agencies have to be modified to accommodate the requirement of both.

The Member States need to:

a. Invest additional resources to strengthen systems to forewarn, contain and mitigate the impact of hazards occurring in the Region. For health emergencies these would also include the PHC system, especially for delivering the essential public health functions and supporting services.

b. Make provisions for funds, when needed, to mitigate the socioeconomic disruption caused by the emergency and to remove the sequelae, such as radiation or chemical poisoning.

c. Develop flexible decision-making and spending rules to address the financial demands of the response to the emergency, while retaining financial prudence.

d. Ministries of health should advocate for securing domestic funding including the private sector and support from international and national development partners for implementation of the NAPHS through appropriate decision-making committees.

5.A. 2. Information, surveillance and intelligence

Efficient risk assessment and surveillance systems with the One Health approach

Surveillance, investigation and risk assessment inform decision-making to minimize the health and socioeconomic consequences of all relevant hazards and public health threats. Early warning function and public health intelligence are fundamental to guide timely and effective public health actions. Mechanisms to enable the One Health approach through joint efforts and information exchange is needed, engaging all relevant sectors. Sufficient numbers of adequately trained experts to anticipate and assess the magnitude of the hazard, such as meteorologists, geoscientists and epidemiologists are needed to ensure performance and quality of surveillance systems, investigation, risk assessment and rapid response, not only at the national level, but also at subnational levels.

The Member States need to:

a. Ensure that surveillance systems provide effective early warning and are adaptable to evolving information needs before and during emergencies:
i. Ensure that surveillance systems are in place for relevant hazards, and that systems are efficient, adaptable and capable to provide timely information.

ii. Strengthen early warning functions, including through effective event-based surveillance and rapid response capacities.

iii. Enhance capacities and resources for field and cluster investigation to inform evidence-based response actions.

iv. Strengthen genomic surveillance of pathogens with epidemic and pandemic potential.

v. Strengthen data management capacities to cope up with the volume of information being collected to analyse the epidemiological situation to make timely public health decision.

vi. Capitalize on effective use of digital and information technology for surveillance and information management.

c. Strengthen the epidemiologist workforce for effective surveillance, investigation, rapid response and risk assessment at the national and subnational levels:

i. Review and strengthen programmes to enhance the epidemiologist workforce through sustainable field epidemiology training programmes, aligned with country specific strategy and plans.

ii. Strengthen capacities and systems in surveillance, investigation and risk assessment, as well as of multidisciplinary rapid response teams, at the national and subnational levels.

iii. Plan in advance for surge capacities for surveillance, contact tracing, quarantine and isolation, allowing evidence-driven and risk-based calibration of public health social measures and more targeted response.

d. Strengthen the regional collaborative information-sharing platform for alert and risk assessment:

i. Strengthen IHR NFPs and IHR event communication.

ii. Strengthen timely international sharing of information on acute public health events.
5.A.3. Public health systems

3.1. Strengthen systems at PoE and to efficiently manage international travel and transport

While international transport, travel and trade contribute to economic development and welfare of populations, they may also pose public health risks. High traffic at air, water and ground crossings in the country could play a key role in the international spread of diseases through persons, conveyances and goods. The current COVID-19 pandemic has highlighted that timely implementation of appropriate measures in response to public health risks at PoE through a risk-based approach, including protecting the staff posted there, can delay risk of importation of new variants and spread of new infectious diseases.

The Member States need to:

a. Designate PoEs under IHR, conduct appropriate risk assessment, develop, and implement contingency plan and risk communication strategy at PoE, provide infrastructure, equipment for screening, PPE and build the capacity of regular and potential surge staff.

b. Improve multisectoral coordination and adopt a risk-based approach for management at PoE including appropriate surge capacity management, effective and efficient referral mechanism for ill travellers and screening and management of illness in PoE staff.

c. Ensure the SOP, framework and/or mechanisms are in place to make evidence-based and risk-based decisions to adjust border measures, guided by a thorough evidence-based risk assessment, without excessive interference on international traffic and trade.

d. Strengthen cross-border collaboration and the information-sharing mechanism at normal times that can be scaled-up during emergencies.

e. Ensure efficient linkages of PoEs with national surveillance and public health laboratory systems and conduct international contact tracing in a coordinated and collaborative manner by rapid information sharing through the IHR-NFPs with relevant Member States and WHO.

3.2. Vaccination

Vaccines remain the most effective biomedical response to preventing the spread of vaccine-preventable infections that often appear after the disruption of systems caused by emergencies. Where vaccines against potential diseases are available, they must be deployed immediately. New vaccines pose a diverse set of challenges. Since most health systems are not oriented towards adult vaccination and since child immunization is an essential health service that should not be disrupted, additional capacities have to be added for adult vaccination as part of the preparedness efforts.

To ensure offtake of vaccination:

a. Augment vaccination systems, including cold chain, transportation services, vaccination centres and trained additional human resource to roll out adult vaccines when required, without impacting routine immunization services.

b. Prepare a list of persons eligible for vaccination, classified in order of priority of risk, publish the list and notify eligible persons. Develop systems for registration, allocation of dates, arranging vaccinators, managing adverse events from vaccination, if any.
These systems can be tested by rolling out available adult vaccines during normal times. Care should be taken to ensure that the marginalized, infirm and people residing in locations hard-to-reach, access compromised areas and high-risk populations have access to vaccines.

c. Reinforce accountability, good management, human and financial resources, a resilient, well-trained and well-supervised workforce, and good data systems to monitor and track the implementation of COVID-19 vaccination and to adjust the strategy as necessary.

d. Publish the data regarding efficacy, side-effects and any other relevant data for vaccine advocacy, to remove vaccine hesitancy and educate resource persons to answer queries on vaccines. Systems for monitoring and promptly investigating AEFI and continued monitoring of vaccine efficacy by linking with data on post-vaccination infections and hospitalization are also needed to encourage trust in vaccines and to prevent AEFI.

e. Strengthen international agreements and collaborations for cross-border immunization, surveillance, vaccine effectiveness studies and information-sharing, including use of agreed upon vaccination certificates.

f. Strengthen systems for post-introduction evaluation, seroprevalence, vaccine effectiveness studies, research and development, production capacity and cold chain, etc.

5. A. 4. Systems for providing health care

4.1. Preparations to deal with surge of patients

Health systems in general and hospitals in particular are designed to carry redundancies to manage surges in patient load. However, emergencies can cause surges that far exceed the planned redundancy. Preparedness to handle such surges include developing contingency plans for scaling up the availability of the components of health care, designing systems to manage the inflow and providing quality services when the capacity of the health system to provide services have been reduced as a result of the emergency. SimEx, developing contingency plans and training workforce on managing known health crises and injuries and providing supportive care for unfamiliar conditions or pathogens have to become a part of the preparation. Since most health emergencies, especially new pathogens, radiation and chemical hazard will have unknown sequelae, Member States should put in place systems for surveillance of health impact on affected persons.

To manage health impact of emergencies, the Member States must:

a. Conduct scenario-building and SimEx periodically to manage the large influx of patients, based on risk assessment of multihazards to achieve clarity for the managers and staff on their roles during a crisis. Define standard management pathways for known health issues and generic clinical management protocol for supportive care and develop capacity-building modules and training sites to rapidly orient the health workforce.

b. Develop the incident management centres to manage the impact of health emergencies including allocation of patients and resources. As the severity of their condition would vary, patients can be managed at a hierarchy of health facilities, based on a principle of subsidiarity, to optimize resources with predefined criteria for
escalation. These centres can also be equipped to provide regular information to the public.

c. Prepare contingency plans for rapidly expanding infrastructure through make-shift hospitals, quarantine and isolation centres, using green field or repurposed buildings; human resources, through task-shifting or training new persons; equipment and consumables, by repurposing the production of units manufacturing similar products to items needed for the response to the health emergency.

d. Scale up capacity for health-care systems through surge staff (both health and non-health) and dissemination and compliance with rapidly changing guidelines and SOPs for case management, referral mechanisms and isolation and quarantine measures are critical for effective case management

e. Develop innovative health-care delivery mechanisms, such as home-based care, expansion of telemedicine and alternatives to hospitals, including mobile clinics could be utilized to overcome the delayed health-seeking behaviour due to fear of stigma.

f. Institute regulatory and negotiated processes to engage the private sector to access additional resources for treatment and systems to engage with partners such as civil society organization, academic institutions and development partners to mobilize additional technical and material resources when needed.

4.2. Infection prevention and control and antimicrobial resistance

IPC is critical for preventing and containing the transmission and evolution of pathogens and to protect the caregivers and the affected individuals from HAI. An integrated national IPC strategy, guidelines and a national programme that includes HAI surveillance, through adequate training of health personnel and volunteers, is crucial to guide IPC implementation. Integration of IPC with safe WaSH at health facilities and efficient health-care waste management would serve as the base for enhanced response during an emergency. Timely and sustained supplies of PPE and stockpile need to be ensured for equity in pandemic countermeasures.

AMR is a persistent threat to human and animal health even during normal times. One Health-oriented tracking of resistance of pathogens in animals and environment and in health-care associated settings, which is an integral part of AMR surveillance, is a potent mechanism to identify zoonotic and new pathogens. Hence, strengthening surveillance as part of IPC and AMR has a beneficial impact on early detection of infectious diseases. If treatment is not provided under a strict AMR policy, without following prescription protocols during a health emergency, it could lead to worsening of AMR and in treatment outcomes.

The Member States need to:

a. Implement an integrated national antimicrobial surveillance and prevention programme and a national programme on IPC governed by national strategies, and guidelines with dedicated/role-assigned staffing. The information on pathogens gathered as part of AMR and IPC surveillance should be monitored for emergence of any pathogen of concern and zoonoses with potential for spill-over.

b. Ensure arrangements for treatment of chronic infectious diseases such as HIV and TB, undisrupted supply of antimicrobials to the patients is critical during emergencies both for their survival and to prevent prolonged coinfections due to immune compromise that would lead to the emergence of variants.
c. Establish for each healthcare set up, however small or big, a hospital/health-care infection control committee (HiCC) or team, with a designated IPC officer. All health-care facilities should have their own IPC manual with guidelines on patient and health-care worker safety, prevention and control of infections, and rationale usage of antimicrobials and additional members as required to manage HCWM and health facility WaSH.
   a. Develop regulations and legal frameworks to enforce IPC requirements and policies, supported by accreditation systems or other mechanisms that have been agreed upon at an international level.
   d. Establish and implement surveillance for HAIs across the health facility and in special care setting prone to higher levels of secondary and nosocomial infections.

5.A.5. Community engagement

5.1. Invest in building trust of communities in government and health authorities

Trust in government is an important determinant of a successful response to all emergencies. Trust emerges from willingness of governments to take communities into confidence, share accurate and real-time information and demonstrated competence in responding to past emergencies. Member States could strengthen their RCCE strategies to build trust. Systems and structures to involve of communities in planning, decision-making and implementation especially in managing essential public health functions and social determinants of health, can be leveraged to respond unitedly to an emergency.

To effectively collaborate with communities, the Member States should:

a. Strengthen enabling policy and environment, with financial resources and supported by governance, for community engagement, especially public health, which can also be mobilized for emergency preparedness and response.

b. Listen to and engage with communities, individuals and key influencers (e.g. civil society organizations, faith-based communities, internet-based communities) to develop solutions and successfully address rumours and misinformation.

c. Improve risk communication systems and capacity to enable timely and transparent communication, linked to surveillance, risk assessment, and remedial measures to be taken. Communication with communities should explain the need and criteria for the PHSM, the periodicity and way information will be provided, how their queries and grievances will be addressed and how the adverse impact of emergency on the population will be monitored and mitigated.

d. Document and disseminate reviews of performance including achievements and failures and lessons learnt for managing future emergencies once the emergency has passed.

5.2. Building capacity for infodemic management and utilization of socio-behavioural and cultural insights in emergency risk management

It is critical that during disease outbreak responses – whether of emerging infectious diseases such as COVID-19 or other communicable diseases – systems for dynamic listening are in place: for authorities to be able to answer what people are asking, address what worries them and counter misinformation, disinformation or mal-information that increase exponentially labelled as an “infodemic”, which oftentimes spreads faster than the epidemic itself. With the fight against infodemics heavily concentrated in social media, comprehensive
mechanisms, tools and capacity to conduct digital listening has to be in place, capable of two-way real-time as well as anticipatory listening and proactive and effective RCCE.

During the regional meeting to strengthen implementation of the “Risk Communication Strategy for Public Health Emergencies in the WHO South-East Asia Region: Learning from best practices and lessons from COVID-19 response” in August 2021, the Member States, partners and the WHO Secretariat agreed to establish an infodemic alliance engaging multiple partners at the regional and country levels.

Systems and capacities for gathering of behavioural and sociocultural insights on a periodic and continual basis is also critical to understand both catalysts and barriers/challenges in service and response intervention utilization of different areas of the country and segments of the population. Such insights need to be effectively utilized in the design and/or the modification of interventions to ensure optimal coverage.

The Member States need to:

a. Establish a dedicated national set-up and system for risk communication with a national strategy and guideline with optimal functional authority and oversight.

b. Establish an infodemic management mechanism as an essential function of risk communication in synergy with information and communication; and management and service provision systems used for disease surveillance, behavioural change communication and health promotion.

c. Establish collaboration with partners and institutions with expertise including in anthropology, sociology, communication, etc. for gathering, analysing and synthesizing information on behaviour and sociocultural practices to generate practical insights for designing, modifying interventions and interrogating their performance.

d. Set up a forum to facilitate multisectoral coordination for risk communication and collecting feedback from the community and analyse them to inform RCCE strategies. Tailor the communication materials to suit local context and target audience.

5.A.6. Enabling systems resilience

Resilience is the capacity of the system to continue to discharge the core functions and deliver core outputs, despite being subjected to shocks. Resilience may be characterized as absorptive, adaptive and transformative. All systems carry surge capacity to absorb some degree of shock. Some resources are amenable to being repurposed, during the time of crisis, to adapt the system to handling the shock. But given the experience of COVID-19, systems must be designed to be transformed to meet challenges of unknown nature and magnitude. Resilience is needed in every building block of the health system and the way they function together as a unit.

6.1. Health workforce

Health workers, who are the frontline defence against health emergencies, will be adversely affected by the hazard causing the health emergency, due to its impact on themselves or their families and the stress of the response. The need for health workers will go up at the same time when their availability will come down. Therefore, it is important to protect the health, well-being and social security of health workers. The flexibility to rapidly scale up
their numbers is constrained by the long period of training they require and entry restrictions into the cadre.

To address the need for additional health workforce, the Member States can:

a. Map human resources at different geographical locations, identify unutilized capacities in the system that can absorb additional load and develop protocols for redeployment from unaffected regions. To task shift for meeting the health needs of the emergency, define competencies needed for supportive care or care specific for known emergencies and develop training modules to rapidly build this among health staff.
b. Mobilize additional resources from the private sector and public volunteers. Establish emergency accreditation procedures to train and certify staff and volunteers to carry out the needed tasks. Procedures for regulatory approvals of task-shifting and engaging volunteers must be approved in advance.
c. Develop systems for health workers to seek support as they face multiple stressors during an emergency, including personal protection, treatment, social support, preventing burnout and addressing mental health issues.
d. Create knowledge systems for the workforce to learn from each other and to synthesize their learning into policy and implementation so that their experience can inform modification of policies, strategies and implementation plans. Develop a continuity plan with clear protocols for hand over by transitioning personnel and induction of new personnel.
e. Follow evidence-based best practices from Member States to ease the workload of health-care workers and minimize the exposure to hazards through interim rosters and duty shifts.

6.2. Augmenting systems to support the response

All components of systems will come under stress during an emergency. Member States need to anticipate this and build resilience by leveraging the strengths of different sectors, increased investment and creating systems for optimal utilization of available resources.

The Member States need to:

a. Strengthen the systems that play a supporting role in managing emergencies, with flexibility to scale up rapidly, for procurement and supply chain management, transportation arrangements for patients, laboratory samples and materials and information and communication technology (ICT) systems.
b. Test supply chains for resilience to disruptions in national and international supplies. Considering supply chain security, Member States may consider strengthening local manufacture, even if it is more expensive than imports and stockpiling of critical drugs and devices. Special procedures must be prescribed for procurement during emergencies, with the required scalability and flexibility.
c. Strengthen incident management rooms with details of assets available to manage the relevant emergencies, access to data on their deployment and personnel trained on managing to optimize utilization of resources.
d. Identify clear channels of communication and set up schedules for sharing information on status of the emergency and response with the authorities, partner institutions, media and the public.
6.3. **Strengthening diagnostic preparedness and laboratory systems at different levels**

Well-functioning, sustainable laboratory services, operating according to international principles of quality and safety are needed for decision-making in all aspects of health services. Public health laboratory systems with adequate and appropriate equipment, supplies, reagents, protocols and personnel are needed confirmation of the alerts and estimation of the magnitude of likely impact. For known risks, early warning systems can alert authorities to mobilise. For infectious diseases, appropriate laboratory services to detect known pathogens can be installed for prompt screening and confirmation of suspected pathogens. In both, quality and speed are vital. Facilities for genomic surveillance at least at national level augmented by a collaborative regional network of institutions with the requisite expertise would be essential as per the learning from COVID-19. Multisectorial collaboration and networking with effective links between laboratories and surveillance and response systems is needed for the timely detection of outbreaks and emerging pathogens. Mechanisms for rapid information and sample sharing at national, subnational and international levels are essential for public health decision making and development of medical countermeasures.

To strengthen diagnostic preparedness and laboratory systems, Member States shall:

a. Strengthen national leadership, governance and multisectorial collaboration to advance national diagnostic strategies, advocacy and political commitment
b. Ensuring adequate financing and resource mobilisation to build and modernise laboratory networks for health emergencies and improved clinical care
c. Build agile and resilient laboratory systems through training, establishing tiered networks, interoperable data management systems and integrated laboratory and surveillance systems
d. Promote research, development of and access to new and innovative technologies through the establishment of a regional diagnostic advisory group, strengthening of regulatory processes and enhancing national biorepositories
e. Maintaining resilient laboratory systems through institutionalising quality improvement exercises, laboratory network optimisation and establishing a monitoring and evaluation framework for functional laboratory systems

6.4. **Harnessing technology for service delivery and efficiency**

Innovative technologies can be leveraged to increase the effectiveness and safety of response to the emergency. Developing systems for collection and analysis of large volume of data and extracting factors aggravating the impact, developing alternative scenarios on future impact based on analysis of current data, identifying potential solutions, tracking, and tracing contacts and providing clean up, therapeutic and diagnostic services with lesser physical involvement of workers can be planned in advance.

The Member States can:

a. Landscape the emerging innovative technologies to assess their utility for managing emergencies by reducing risk to workers, including robotics, telemedicine, remote diagnostics and remotely guided intensive care units, increasing reach of preventive and management efforts and pilot their application in the field.
b. Support the application of digital technologies by electronic health records, applying artificial intelligence for analysis and decision support for care and prevention efforts and for scenario-building. Digital applications for providing psychological support to health workers, infected and affected persons and manage risk communications can also be assessed.

c. Make arrangements to train the workforce to adopt and use appropriate technologies. Similarly, an economic evaluation on the lines of health technology assessment is needed before adopting new technologies.

6.5. Building capacity for conducting and utilizing research

The South-East Asian Region has many challenges, which have not been adequately researched. Member States need to invest more in research into them. Since addressing emergencies is a global public good the Member States of the Region should share research knowledge and facilities and collaborate for research into common problems.

The Member States should:

a. Build national capacity for research into climate change and their impact in the Region, predictors of natural disasters, epidemiology, microbiology, clinical and pharmaceutical research, vaccinology, and policy and system response to emergencies. They need to encourage research at every level of the system managing response including building capacity for embedded research by practitioners.

b. Train and encourage policy-makers and managers to pose research questions for implementation research that can contribute best to policy-making and strategies on prevention and management of multihazards as part of their work.

c. Collaborate regionally for research, designing and funding research that would be of interest to more than one country, helping to build capacity for and mentoring countries that need them and sharing the results of their research.

5.A.7. The role of WHO

WHO will support Member States to strengthen emergency preparedness by:

a. Facilitating the establishment of the Regional Health Emergency Council of Heads of States to address obstacles to equitable and effective preparation and response ensuring collective, WoG and WoS action, aligned with global and regional health emergency goals, priorities and policies; to foster compliance with and adherence to global and regional health agreements, norms and policies; and to identify needs and gaps, swiftly mobilize resources, and ensure their effective deployment and stewardship.

b. Reviewing international and regional good practices to prepare options for each of the areas listed above that Member States are keen to pursue. These would be made available to Member States who will also be assisted through scenario-building of potential health threats to help them select the approaches most suited to their situation. Helping Member States to choose, adapt and contextualize technological innovations that have proved to be effective in other countries and regions and in comparable situations and arrange for mentorship to adopt them.
a. Assisting Member States for initial capacity-building on the chosen interventions. This will involve facilitation of learning from each other and connecting with centres of excellence at the regional and global levels and with WHO Collaborating Centres.
b. Developing and implementing proof of concept pilots with feasible interventions chosen by Member States, preferably in most countries for validation. WHO will help document the steps and develop the instruments used to scale-up successful pilots.
c. Facilitating collaboration between Member States for mutual learning and collaboration on implementation. This will include cross-learning between national academic institutions, laboratories and practitioners and joint research on issues of regional interest conducted by institutions in countries of the Region.
d. Mediating between Member States with greater capacity in production of drugs, consumables and vaccines to factor in requirement of countries with less resources in their growth and production plans and WHO will intermediate to ensure security of supplies. WHO will facilitate laboratories in some countries to act as reference laboratory for other countries who request such support.
e. Carrying out policy advocacy for the measures recommended in this document and to bring national leaders together to generate consensus on advance preparation for responding to health emergencies.
f. Advocating for creating shared plans for addressing health emergencies that have the potential to strike more than one country of the Region including earthquakes, floods, heat waves or radiation hazards and acting as the coordinating agency for the shared planning exercise.

5.B. Steps to be taken during the health emergency to reduce its impact on the population and to protect the vulnerable

Emergencies will occur despite all efforts at prevention. While advance preparations are necessary, managing the response efficiently, through carefully monitoring the evolution of the emergency and scaling up the response commensurate with it, is needed to reduce the impact of the emergency.

B.1. Reduction of the impact of emergencies

When hazards that can be anticipated by early warning and public health systems occur, the protocol for containment must be initiated immediately, with a WoS and WoG approach, to contain the negative fallouts. Even when an emergency has arisen from an expected hazard, the preparedness measures must be promptly activated and efficiently executed.

To ensure this, the Member States should:

a. Activate the regulatory mechanism to implement appropriate PHSM measures, through risk-based approach in the country to contain the impact of the infectious disease.
b. Establish and maintain systems for:
   i. Screening people at PoE into the country, observing IPC measures and for keeping persons from known epicentres under observation, for infectious diseases from other countries. For natural calamities and industrial disasters look for markers of the diseases such as contaminated food and water, vector population, ground and water radiation and pathogens in wastewater. The public
health authorities should have systems for generating geographic information system (GIS)-based heat maps showing clustering of diseases in the community.

ii. Adopting public health measures to reduce the health impact of all hazards and providing counselling and psychosocial support to the affected persons.

iii. Monitoring IPC in health-care settings by strict enforcement of universal precautions, and surveillance for HAIs.

iv. Ensuring continued epidemiological investigation to monitor emergence of variants.

c. Activate prevention measures such as:

i. clearing of debris including carcasses of dead animals, cleaning drinking water sources;

ii. decontamination, emergency sanitation, wastewater, and solid waste management systems to prevent further deterioration of health of the affected population; and

iii. instituting M&E systems to assess the change in the epidemic situation based on real-time information and developing strategies to respond to the emerging situation.

B.2. Treatment of persons with health issues and sequelae

An adequately prepared health system is able to anticipate the surge of persons with health issues during any major emergency and mobilize for meeting the surge in demand. The SOPs, which had been part of the training of the workforce and managers during the SimEx, supported by strengthened enabling systems are to be put into operation at this juncture.

To manage health impacts of emergencies, the Member States must:

a. Operationalize the emergency operations centres (EOCs) for incident management and the linked information, transportation and management systems. Start registration and categorization of suspected and confirmed patients along with their degree of severity and begin the allocation to different management centres based on criteria for escalation.

b. Implement the contingency plans for rapidly expanding the capacity to respond to the emergency based on an assessment of the current and emerging scenario.

c. Activate the regulatory and negotiated processes to engage with the community and the private sector to mobilize addition resources.

b. Institute systems for registration and follow up of recovered persons for sequelae of the impact of pathogen, chemical or radiation emergencies, starting with known sequelae and detecting new ones that emerge. The data may be analysed to see if there are any emerging patterns.

d. Document and disseminate lessons learnt from current health emergency to fine-tune the response to future ones.
B.3. **Maintain essential health services**

Due to increased salience and the political costs attached to a health emergency, important and time-sensitive health services may be ignored. Not providing such services including child immunization, treatment for noncommunicable diseases, tuberculosis, malaria, HIV/AIDS, mental health, and such lifesaving support as ensuring emergency treatment, continuity of chronic care, post-transplant, and post-cardiovascular emergency treatment, and providing other critical medicines, has severe long-term consequences and Member States should develop systems for protecting them even during the direst emergencies. Also essential for sustaining the response and preventing long-term fallouts is to provide mental health services to address the impact of the crisis on individuals.

To protect continuity of essential services, the Member States should:

a. Define elective procedures and treatments that may be deferred to free up resources and essential health services which must be maintained during the emergency. A service delivery map detailing where the essential services, including medicines and devices would be provided during the emergency, must be prepared.

b. Ensure that repurposing of staff for response does not hamper the continuity of essential services. Public–private partnership is essential to fill staffing gaps.

c. Develop monitoring and implementation systems to ensure that the defined set of essential health services are maintained.

d. Set up systems for mental health support to communities and responders affected by the crisis and the stress of responding, especially addressing the needs of vulnerable populations.

B.4. **Manage infodemics**

While robust risk communication strategies to provide reliable information from trustworthy sources could create an atmosphere of confidence, experience shows that infodemics will occur with the starting of an emergency. Managing them should begin immediately too, as beliefs once established are difficult to remove and can be built on. This process will need to continue till the crisis is over.

The Member States can defuse infodemics by:

a. Monitoring messages on mainstream and social media and responding promptly to any false or malicious messages and maintaining regular interaction with the media and community.

b. Maintaining easy access to important information on trusted sites and promote their use by the community and respond to queries regarding messages circulating in the media or community.

B.5. **Special attention to addressing the needs of persons more susceptible to the impact of social and economic disruption and less access to services**

The impact of emergencies will be fall disproportionately on vulnerable and marginalized communities. They also have less access to prevention and treatment services and are often last in the line to access vaccination. Due to their increased vulnerability, addressing their needs will have a beneficial impact on the health emergencies and increase trust and willingness to comply with social restrictions. Since such groups have traditionally been
distrustful of authority, they are likely to comply with restrictions only if their needs are seen to be taken care of.

To facilitate this, the Member States should:

a. Engage with communities who traditionally have less access to health and social support services (e.g. indigenous communities, migrant workers, slum-dwellers) to monitor and address the impact of the crisis and effectiveness of mitigation and treatment.

b. Understand and address trust issues regarding messaging on prevention, treatment and vaccination measures and in partnership with community organizations or volunteers, facilitate access to services.

c. Strengthen psychosocial and mental health services, as part of the health system, and by identifying community-based solutions for different populations, such as children, adults, health-care workers and vulnerable populations.

d. Prioritize impact-reduction measures, including screening and vaccination, for the marginalized by keeping service sites in accessible locations and engaging with community leaders to increase offtake of services.

B.6. The role of WHO

WHO shall support the process by:

a. Convening the Regional Health Emergency Council of Heads of States, as often as required, to coordinate the response in the Member States and the Region.

b. Sharing SOPs to manage the different hazards the Region is subjected to, standardize treatment protocols, validate clinical outcomes for experimental therapies to address new threats, collect and share experience between Member States on prevention, treatment and management strategies.

c. Remaining in touch with Member States to share any health threat that they face and during the crisis, provide continuous technical support to evaluate the evolution of the emergency and recommend strategies to deal with them.

d. Acting as the conduit between international and national expertise and facilitate collaboration between Member States to share experience and material and technical resources. Support documenting the lessons learnt from managing the health emergency in the Region.

5.C. Regional and global initiatives and linkages

1. Establish a Regional Health Emergency Council in line with the Global Health Emergency Council, where the heads of governments of Member States can decide on various coordination issues such as vaccine implementation, trade and travel measures.

2. Improve national alert functions and share information immediately on detection of the threat nationally and with WHO and continue to share information, till the outbreak is assessed to be over, through further strengthening existing mechanisms such as the Global Outbreak Alert and Response Network (GOARN), Regional DVA hosted in EOCs.

3. Contribute to strengthening the regional and global information-sharing platform, and regional risk assessment. This includes strengthening systems for sharing epidemiological, clinical, pharmaceutical, biological, and genomic information and/or samples for genomic sequencing in a timely manner. Collaborate to promote digital platforms for sharing real-time information, registration for and administration of vaccines.
4. Establish a Regional EOC-NET for timely information-sharing and conducting regular capacity enhancement through training and SimEx (table-top exercises and drills).

5. Establish integrated regional network of laboratories to augment capacity for quality-assured diagnostics and genomic surveillance by further strengthening WHO Collaborating Centres and National Centres of Excellence to share facilities with and build capacities of countries that do not have them.

6. Establish a network of policy-makers, practitioners and researchers to collaborate on knowledge generation and dissemination through strengthening knowledge management networks such as the South-East Asia Regional Knowledge Network for IHR Focal Points on a regular basis. Develop and maintain regional repositories of best practices.

7. Support collaboration on production, procurement and distribution of drugs, consumables, and vaccines. The Regional Office to stockpile essential supplies to protect from market disruptions and trade restrictions.

8. Collaborate with other Member States to examine and support the development of the next iteration of the bi-regional health security framework for the Asia Pacific Region for identified priority technical areas, building on the experience of the Asia Pacific Strategy for Emerging Diseases - III (APSED-III).
IX.6. Implementation approaches

The Regional Strategic Roadmap recognizes that in addition to health emergencies common to the entire Region, Member States face differing threats and have different levels of capacity. However, the fundamental principles of implementation remain the same across countries.

WHO will initiate the establishment of the Regional Health Emergency Council of Heads of States who will provide guidance, directly or through subcommittees, on taking the recommendations of this strategic plan forward.

1. The foundational role of knowledge gained from past experience and research

Aside from newly emerging pathogens, the South-East Asia Region has faced many health emergencies ranging from cyclones, floods, earthquakes, heatwaves, chemical spills and infectious diseases. Equipment and analytical tools that can predict some of these have also been developed and many Member States have demonstrated capacity to anticipate and take preventive action. The Region has also gained experience in managing health emergencies once they have occurred. The first step in taking this plan forward is to analyse these documents and draw lessons from them. WHO will help Member States identify the knowledge required for advance preparedness.

2. Analysis of vulnerability and overcoming the gaps identified

The roadmap lists out the areas where health system strengthening could be needed. Member States can analyse the capacity of the systems to meet the threats and needs of different areas of the country. Gaps, if any, identified in the review will indicate the additional investments needed. Matching them to financial and absorptive capacity of the country an action plan with timelines needs to be published. Analysis of regulations, financial and governance arrangements appropriate to dealing with the emergency can identify areas that need rectification or additional work in this area. The competencies required to deliver the tasks listed in the action plan need to be defined, assessed and augmented where needed. WHO shall, in consultation with Regional Health Emergency Council of Heads of States, provide technical support for these assessments and studies.

3. Achieving the capacity for transformative resilience

This is needed to address threats that are as yet unknown or scale up to levels never needed in the past, which needs out of the box thinking and a willingness to cut through regulatory and organizational boundaries. SimEx and scenario-building can project the levels to which systems will be stretched and widespread discussions can be held to develop modalities for transformation that would be acceptable.

4. Community engagement

Systems for engaging the community as partners are available in many sectors in countries of the Region. It is also an important component of the South-East Asia Regional Strategy for Primary Health Care: 2022–2030. Since communities are necessary partners in managing health emergencies, lessons learnt in other nations and sectors can be transferred to deal with health emergencies. The method and time of engagement, mediating agencies to facilitate engagement, the information to be communicated to communities, etc. need to be worked out.
Modalities of engagement can be fine-tuned over time, starting with predictable, known emergencies such as a periodic infectious disease. Communities should be invited to assess and communicate the efficacy of the engagement.

A policy decision needs to be taken on the extent to which information will be shared with the community when a health emergency breaks. In the absence of real-time reporting of factual data, it is difficult to instil trust in the government, which is a necessary condition for successful management of a pandemic.

5. **Harnessing technology**

A scoping exercise, based on secondary sources, of the technologies currently available to manage emergencies can be done for the entire Region by WHO. From this, the countries select the technologies suitable for them which can be customized by expert institutions in their area, who can also hand-hold its adoption.

6. **Research**

Institutions to lead on research on each topic identified in the action plan can be identified in each country. For those countries that do not have institutions with adequate capacity, WHO can arrange for mentoring from institutions in neighbouring countries.

7. **Financing**

As Member States of the Region face financial stress after the pandemic, the general government expenditure (GGE) may not grow fast enough to provide the needed finances for strengthening PHC and for the system strengthening recommended in the action plan if government health expenditure (GHE) is maintained in the same proportion as in the past. But considering the economic value of spending on health care, as demonstrated by COVID-19, governments must prioritize health expenditure by allocating a larger share of GGE to health expenditure. A policy decision on this can be taken in the Regional Health Emergency Council of Heads of States.
IX.7. Monitoring and evaluation framework

There is a robust monitoring and evaluation framework for IHR. This is familiar due to the continuous engagement on this topic between WHO and Member States over the years. Its global indicators, captured in the mandatory and voluntary reporting, are adequate to help Member States assess their core capacities and preparedness to respond to public health risks and emergencies of national and international concern. Like the previous Regional Strategic Action Plan, the purpose of this document is to help Member States assess their threats, using an all risks, multihazard approach, and gauge their capacities and develop an action plan to protect their populations.

Since the regional roadmap is focused on strengthening national systems, most of the focus areas and strategies will not require additional data collection or reports with unique indicators other than the ones currently under use. If any critically important indicators are not available in the IHR M&E framework, they shall be sourced from existing reports on health system and ERM performance reports.

1. Indicators of decentralized systems

Since the purpose of this roadmap is to improve national systems to mount a WoS and WoG approach, the indicators may need to capture the complexity of the system, e.g. the role of the private sector and their levels of engagement. Responding to crises are also the task of provincial, town and village governments to finance and provide services and provide social support measures. Therefore, the national indicators must have the provision to drill down to lower levels, especially as emergencies are often localized and information specific to the location becomes vital.

2. A better understanding of the systems software

The current indicators are focused on the hardware of systems, such as infrastructure, equipment and workforce. But the quality of the response to an emergency also depends on the efficiency of the interaction between the hardware and software of the systems, such as trust, morale and the support for innovation. Since socioeconomic differences, gender, migration status and other vulnerabilities limit access to health and social security systems, disaggregated data on inequity in access on account of vulnerabilities will also be useful in planning for preparedness to respond to an emergency. Similarly, learning systems that back feed learning from the field into policy and implementation decisions, and decentralized leadership of health systems are other topics that may need to be monitored for the future. If such indicators are needed, they will be finalized in consultation with the Member States.
X. References


- World Health Organization. Regional Office for South-East Asia. (2021). Declaration by the Health Ministers of Member States at the Seventy-fourth Session of the WHO Regional Committee for South-East Asia on COVID-19 and measures to ‘build back better’ essential health services to achieve universal health coverage and the health-related SDGs (https://apps.who.int/iris/handle/10665/344914, accessed 10 August 2022).