



WHO Regional Strategies for Pathogen Genomics

Dhamari Naidoo, May Chiew

SOUTH & SOUTHEAST ASIA
PATHOGEN GENOMICS PRIORITIZATION & IMPLEMENTATION WORKSHOP
September 9-13, 2024
Bangkok, Thailand

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Asia Pathogen
Genomics Initiative



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PATHOGEN
GENOMICS

Sydney Infectious Diseases Institute
Centre for Infectious Diseases & Microbiology
WHO Southeast Asia Regional Office (SEARO)
WHO Western Pacific Regional Office (WPRO)
WHO International Pathogen Surveillance Network (IPSN)



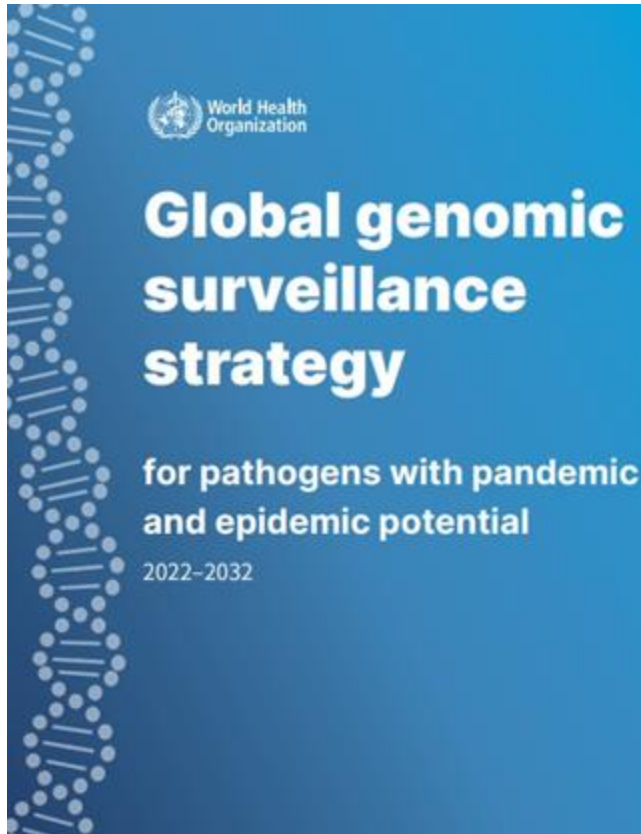
Global strategies

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Global milestones, recommendations & commitments



- **World Health Assembly Resolution 74.7** (May 2021) "urges Member States to increase their capacity to detect new threats, including through laboratory techniques, such as genomic sequencing" (2)
- **World Health Assembly Resolution 76.5** (May 2023) urging Member States to strengthen diagnostic capacity (1)
- Global architecture and systems for **health emergency preparedness, response & resilience** (HEPR) (3)
- **Global genomic surveillance strategy for pathogens with pandemic and epidemic potential 2022–2032** (March 2022) provides a unifying framework to leverage existing capacities, address barriers and strengthen the use of genomic surveillance

(1) <https://www.who.int/about/governance/world-health-assembly/seventy-sixth-world-health-assembly>

(2) https://apps.who.int/gb/ebwha/pdf_files/WHA74/A74_R7-en.pdf

(3) <https://www.who.int/publications/m/item/strengthening-the-global-architecture-for-health-emergency-prevention--preparedness--response-and-resilience>



Regional frameworks - SEARO

Lessons learned in the Region

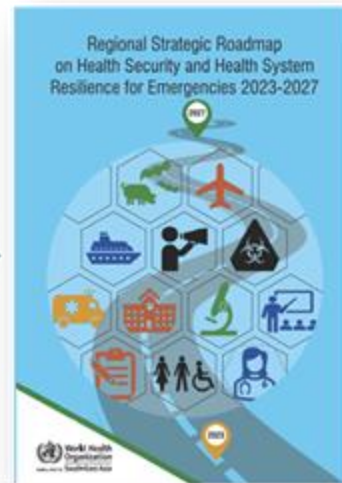
Learning from the COVID-19 to strengthen health security and health system resilience in WHO SEA Region with Member States & experts (Virtual, Oct 2021)



<https://www.who.int/publications/i/item/sea-who-7>

Health security strategic roadmap

Regional Strategic Roadmap on Health Security and Health System Resilience for Emergencies 2023-2027, adopted at the 75th Regional Committee Meeting (Bhutan, Sep 2022)



<https://www.who.int/publications/i/item/9789290209959>

Action Frameworks

Laboratory

South-East Asia Regional Roadmap for Diagnostic Preparedness, Integrated Laboratory Networking and Genomic Surveillance (2023–2027) (Sep 2022)



<https://www.who.int/publications/i/item/9789290209942>

Surveillance

Strategic Framework for Action for Strengthening Surveillance, Risk Assessment and Field Epidemiology for Health Security Threats in WHO South-East Asia Region

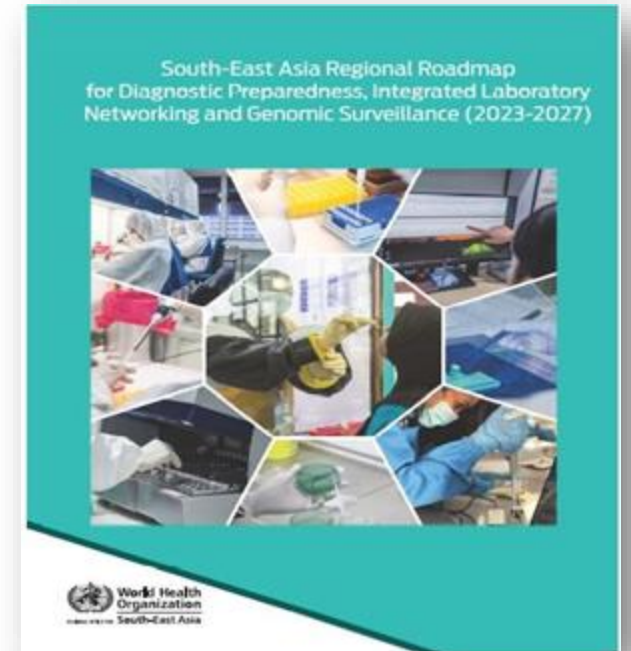


<https://www.who.int/publications/i/item/9789290210030>



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

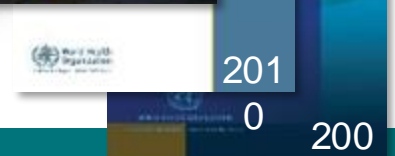
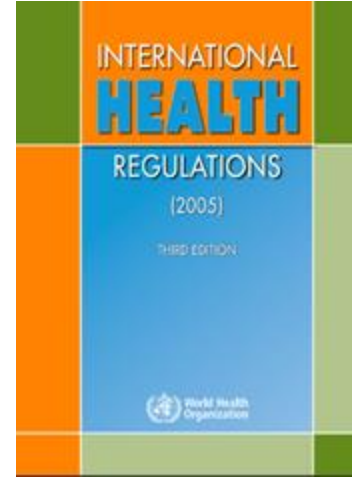
- Strengthen national **leadership, governance** and multisectoral **collaboration**
- Ensuring adequate **investment** to build and modernize laboratory networks
- Building **agile and resilient laboratory systems** with an all- hazards approach
- Promoting **research and development** of and access to new and innovative technologies
- Maintaining and sustaining **readiness** for public health emergencies
- Establish a **trust architecture** for rapid information and sample sharing, access to tools and resources to enable and strengthen pathogen surveillance and sequencing systems



In the Asia Pacific, countries, WHO and partners have worked together to strengthen health security since 2005

Utilizing a common Asia Pacific strategic framework and collaborative approaches to:

- strengthen capacities for the prevention, preparedness, readiness, response and resilience to **multi-hazard** public health emergencies
- implement the **revised IHR (2005)**
- support **multisectoral collaboration** and **One Health** approaches
- Asia Pacific Health Security Action Framework (**APHSAF**): 2023
- Asia Pacific Strategy for Emerging Diseases and Public Health Emergencies (**APSED**): 2005, 2010, 2016



Six interconnected domains for effective health security in the Asia Pacific region

LEAD AND COORDINATE

- Leadership, governance and partnerships
- Multisectoral coordination
- International cooperation and information sharing
- Coordinate regional health security

PLAN AND PREPARE

- Legal and regulatory frameworks
- Health security planning and preparedness
- Health information systems
- Forecast public health events and potential impact

ASSESS AND RESPOND

- Multisource surveillance and risk assessment
- Detect, report and monitor new and unusual events
- Rapid response to limit impact and spread



READINESS AND RESILIENCE

- Prevention and risk reduction
- Deliver essential and emergency health care
- Prioritize measures for groups at risk and with vulnerabilities
- Risk communication and community engagement

SUPPORT AND ENABLE

- Develop and sustain the health security workforce
- Finance health security
- Optimize logistics and operations management
- Strengthen and promote research, technology and innovation

MONITOR, EVALUATE AND IMPROVE

- Assess health security capacities
- Exercise and test emergency plans and functions
- Learn and improve



ASSESS AND RESPOND

OBJECTIVES

Strengthen surveillance systems to enable early warning and rapid response to potential public health emergencies.

SUB-DOMAINS

- Multisource surveillance and risk assessment
- Detect, report and monitor new and unusual events
- Rapid response to limit impact and spread

PRIORITIES

- Coordinate multisector surveillance systems to detect and monitor events and align them to defined public health objectives.
- Strengthen investments in public laboratory networks and services
- Invest in multisectoral genomic surveillance capacities and networks, such as the **EMPACT surveillance network**, to monitor the genetic characterization of pathogens and detect new pathogens and variants as they emerge in humans, animals and the environment.





South East Asia Region

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Effectively use genomic sequence data for surveillance, risk assessment for preparedness and response

Enhancing genomic surveillance for pathogens of pandemic and epidemic potential

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 hub/s
- 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 mechanism 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



Ongoing activities

Integrated respiratory surveillance

- Multiplex testing for flu, SARS CoV-2
- WGS sequencing; multiplex, pathogen specific, metagenomics

Increasing national sequencing capacity

- Wet lab and bioinformatics workforce development
- Variant epidemiology training
- EQAs for improved GSD data and reporting
- Developing sampling strategies
- Included genomic surveillance into NLSP
- National genomics strategies

Challenges

- Supply chain
- Publications from data in public platforms prohibit frequent sharing
- Attrition of workforce
- Reducing funding

Virus characterization and transmission ;

Chandipura virus; Nipah virus , H5N1

Inform diagnosis; mpox

Outbreak response ;
suspect leptospirosis outbreak





Western Pacific Region

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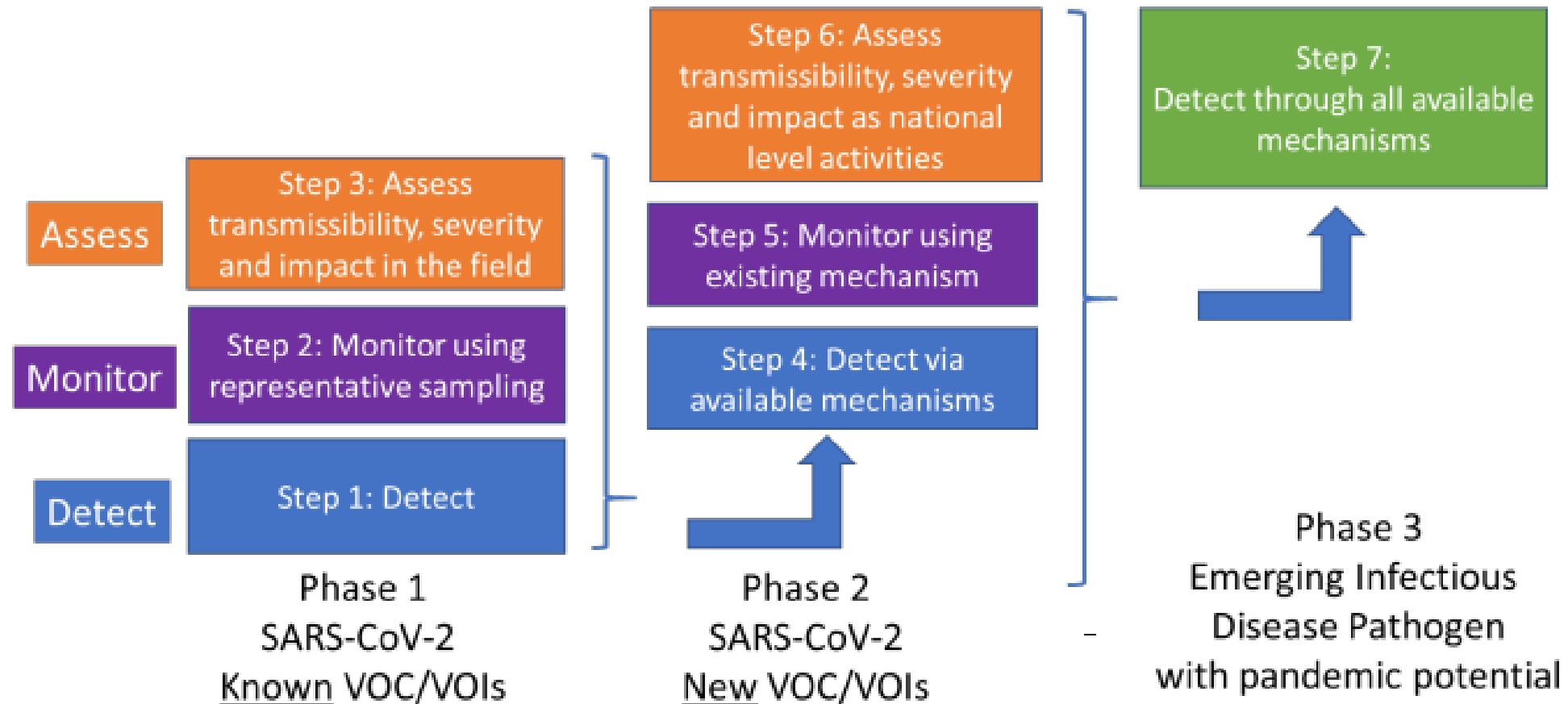
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Emerging Molecular Pathogen Characterization Technologies (EMPACT) Surveillance Network

- Established in 2021 as a regional mechanism for Member States in the Western Pacific Region, partners and WHO
- Aims to coordinate genomic surveillance system strengthening through responding to the COVID-19 pandemic, and to improve future pandemic and epidemic preparedness
- The EMPACT seven-step approach outlines three phases to strengthen genomic surveillance systems
- The Annual EMPACT meeting brings together stakeholders to share experiences, challenges and opportunities of building genomic sequencing capacity and sustainable genomic surveillance systems.



The seven-step approach of EMPaCT



Third meeting of the Western Pacific Region EMPaCT Surveillance Network, 21-22 September 2023: Key Points

1. Genomic surveillance of SARS-CoV-2 and other local priority pathogens is being expanded in the Region, using the EMPaCT seven-step approach
 - Investments to be leveraged and applied to **emerging infectious disease pathogens**
2. Genomic surveillance useful tool during the COVID-19 pandemic- need to improve utilization
3. Genomic sequencing capacity improved through several approaches- in-country capacity/ accessibility
4. Member States face common challenges in establishing and sustaining genomic surveillance
 - **National surveillance strategies** are important for effective integration of genomic surveillance
 - **Linkage of laboratory, epidemiological and clinical information** is critical
 - **Environmental surveillance**: Harmonized technical protocols and linking to public health action
5. The EMPaCT Surveillance Network is a valuable regional mechanism
 - Defining **priority pathogens**
 - Establish a **monitoring and evaluation framework** for genomic surveillance systems
 - Provide resource-limited countries with **ongoing financial, technical and logistical support**



Progress- TSI

- ASEAN+3 TSI workshop in Thailand, Apr 2023
- Training workshop on rapid assessment of TSI with FETP teams in India, Nov 2023
- TSI workshop conducted in December 2023 in Federated States of Micronesia, Dec 2023
- Enhancing assessment of and response capacities to public health emergencies for the Field Epidemiology Fellowship Programme in the Philippines, April 2024:
- Developing tool kit on Rapid TSI assessments in the field



Training workshop in India, Nov 2023



Training workshop in the Philippines, Apr 2024



Progress- Laboratory



Support resource-limited countries in strengthening genomic surveillance capacities, including access to genomic sequencing through referral networks where needed, taking note of the unique settings some countries face, especially small island countries and areas

Capacity building in genomic sequencing – wet lab, bioinformatics, genomic epidemiology, data reporting in publicly accessible platforms

Establishment of in-country genomic sequencing capacities - Fiji



Enrolment into, technical guidance and support to Member States to conduct EQA programmes



Technical guidance and support to Member States about best practices in implementing biosafety and biosecurity requirements and guidelines.

Biosafety and biosecurity operational guide for Member States in the WPR





Key considerations

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Careful planning and stepwise approach required to incorporate genomic surveillance into wider public health infrastructure

- Resource intensive
- Based on country priorities using a multisectoral approach
- Continuous improvement of tools for molecular testing, sequencing and bioinformatics
- Affordable pricing of reagents for sustainability
- Linkages to public health decision making through multisource collaborative surveillance
- Linking plans to exiting national policies (NAPHS, JEE, national surveillance and lab strategies etc) for resource mobilization
 - Global fund, pandemic fund, DFAT... etc





THANK YOU!

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