CE174/20
Provisional Agenda Item 4.9

23 May 2024
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STRATEGY ON EPIDEMIC INTELLIGENCE
FOR STRENGTHENING EARLY WARNING OF HEALTH EMERGENCIES 2024–2029

Introduction

1.   Epidemic- and pandemic-prone diseases, such as influenza and other respiratory viruses, dengue and other arboviral diseases, cholera, yellow fever, hemorrhagic fevers, and plague, remain a significant public health threat in the Region of the Americas. At the same time, new threats from novel pathogens and those related to environmental risks, particularly among groups living in conditions of vulnerability, pose significant challenges in the Region. Efficient and robust early warning and response systems are therefore needed—systems that are able to detect, verify, investigate, and assess public health risks and implement interventions in a timely fashion *(1)*.

2.   Early detection of public health threats allows for the rapid implementation of public health interventions that can save lives and reduce the negative impacts of emergencies, including impacts related to physical and mental health, economic losses, social disruption, and environmental damage. Late detection or failure to detect public health threats can have major negative consequences on individuals, the community, and the wider health system and economy *(1, 2)*. Public health threats are ever-present and have the potential to increase in the next decade due to factors such as rapid changes in social, demographic, epidemiological, and environmental contexts; increases in international travel and trade; and the emergence of new pathogens, all of which can trigger new risks that necessitate effective epidemic intelligence for timely detection and early warning of health emergencies *(3, 4)*.

3.   The purpose of this strategy, which comprises four strategic lines of action, is to support the Member States of the Pan American Health Organization (PAHO) in strengthening epidemic intelligence capacity for early warning of health emergencies under the International Health Regulations (2005) (IHR 2005) framework, while contributing to enhancing the global architecture for health emergency prevention, preparedness, response, and resilience. The Region of the Americas will be the first region of the World Health Organization (WHO) to implement such a strategy *(3, 4)*.

Background

4.   Member States are strengthening their surveillance capacity to detect, assess the risk, report, and provide early warning of acute public health events that may constitute a threat to human health. Efficient early warning relies on epidemic intelligence, a process involving interlinked steps of detection, verification, risk assessment, reporting, and response. Epidemic intelligence combines information from multiple data sources with the aim of protecting the health of the population in the face of outbreaks, epidemics, and pandemics.

5.   In May 2020, the World Health Assembly (WHA) adopted Resolution WHA73.8, entitled Strengthening Preparedness for Health Emergencies: Implementation of the International Health Regulations (2005), which recalls the "commitments made through the Sustainable Development Goals, including to strengthen the capacity of all countries … for early warning, risk reduction and management of national and global health risks," and urges Member States "to continue to build core capacities to detect, assess, report on and respond to public health events as set out in the International Health Regulations (2005)" *(5)*.

6.   Moreover, in May 2021, the World Health Assembly adopted Resolution WHA74.7, on strengthening WHO preparedness for and response to health emergencies, which urges Member States "to strengthen their core public health capacities and workforce for indicator-based and early-warning surveillance, based, inter alia, on disease-specific surveillance, syndromic surveillance, event-based surveillance of health-related behaviour, surveillance data relating to animal and environmental health, enabling detection of public health events requiring rapid assessment, notification, and public health response, in order to ensure that all relevant events are rapidly detected and controlled" *(6)*.

7.   In August 2020, the PAHO Directing Council adopted Resolution CD58.R9, after reviewing Document CD58/6, which proposed strengthening of epidemic intelligence as one of the four strategic lines of action of the policy for responding to the COVID-19 pandemic *(7, 8)*. The recent COVID-19 pandemic highlighted the importance of expanding the use of different data sources and the need for rapid verification of signals of potential public health threats, effective management of considerable volumes of information, and rapid adaptation and continuous innovation to support early warning and response.

Situation Analysis

8.   The Region of the Americas is continuously facing significant public health threats, mainly due to epidemic-prone diseases, including zoonoses, dengue and other arboviral diseases, hemorrhagic fevers, respiratory diseases, and measles. As part of the COVID-19 pandemic response, many Member States have enhanced their epidemic intelligence capacity *(6, 7)*. However, in some Member States, intersectoral coordination mechanisms for epidemic intelligence need to be strengthened. Guidelines and standard operating procedures for conducting epidemic intelligence in a systematic manner on the national and subnational levels should also be strengthened.

9.   Accessing various information channels and data sources, including from non-health sectors, continues to be a challenge in some Member States. A One Health approach to multidisciplinary coordination is needed to foster collaboration and information-sharing within the health sector and beyond. Rapid information-sharing is key, as global interconnectedness has reached unprecedented levels and a public health threat can rapidly spread across the globe. A mechanism to enhance sharing of best practices and knowledge is also crucial to building a stronger global health architecture.

10.   A highly trained and experienced multidisciplinary team from health and non-health sectors, equipped with considerable technical resources, is integral to effectively conducting epidemic intelligence. Accordingly, the successful implementation of epidemic intelligence activities hinges on identifying the necessary specialized personnel, providing them with adequate training, and maintaining their expertise.

11.   Most of the surveillance systems in the Region are designed around notifiable diseases, laboratory confirmation, hospitalized patients, sequencing and phylogenetic analysis, and attributable deaths. However, this approach is often not sufficient for the rapid detection of new or emerging infectious diseases, particularly when early case numbers are small, no historical baseline exists, and diagnosis of cases is uncertain. Moreover, challenges such as data fragmentation; difficulties with accessing data sources on a continuous basis; licensing, ownership and security restrictions; data privacy and de-identification, and the inherent complexity of working with a wide range of data types and formats need to be addressed *(9)*.

12.   The COVID-19 pandemic highlighted the importance of adopting surveillance approaches beyond indicator-based surveillance, such as event-based and community-based surveillance, which are critical to enhance detection and monitoring of transmission patterns, identify trends and changes in viral evolution, and facilitate the development of treatments and vaccines. Event-based surveillance is especially important to address the challenges of early detection in populations living in conditions of vulnerability and those with limited access to health services, including Indigenous Peoples, Afro-descendants, and migrants *(7)*.

13.   Systematic signal detection, through indicator-based surveillance (including disease-based, sentinel, and syndromic surveillance), event-based surveillance, or community-based surveillance, is a key component of epidemic intelligence and should be linked with verification, risk assessment, reporting, and response. While indicator-based surveillance uses official, verified, and structured data with clear case definitions from routine surveillance systems (including human cases, hospitalized patients, laboratory-confirmed cases, and pathogen genomic detection and analysis, as well as cases, detection, and analysis related to animal or zoonotic diseases), event-based surveillance uses unofficial, unverified, unstructured data from multiple sources, such as local news outlets and social media, to detect unusual health events. These data are then combined with contextual data to indicate potential outbreaks. Event-based surveillance also incorporates data from non-health sectors such as animal and environmental health, facilitating a One Health lens.

14.   Event-based surveillance systems generally offer high sensitivity and timeliness, but a data verification process, including on-the-ground verification, is essential to distinguish actual public health events from false alerts *(9)*. Indeed, regional data from event-based surveillance indicate that 24% (n=34/144) of signals verified from 2019 to 2023 were discarded. Community-based surveillance, in which trained community workers and leaders are involved in collecting information from communities on the suspected occurrence or risk of emergence of disease in humans (along with referral of patients who meet community case definitions to health facilities for confirmation and care), animals, and their environment, can detect outbreaks even before they come to the attention of health systems *(9)*.

15.   To detect signals from event-based surveillance, Pan American Sanitary Bureau (PASB or the Bureau) is supporting the implementation of the Epidemic Intelligence from Open Sources (EIOS) system in the Region *(10)*. EIOS, which is used only by Member States and international organizations in the Region, captures information globally in multiple languages on a near real-time basis from over 13 000 sources, including online news and social media, government and other official websites, blogs, and expert groups. This pivotal resource is available for Member States to use to increase the sensitivity and enhance the timeliness of signal detection. As of 22 February 2024, 11 Member States in the Region were using EIOS to detect signals to strengthen their event-based surveillance *(11–13)*. As is the case with community-based surveillance, the implementation of EIOS requires a trained and dedicated workforce with the skills needed to evaluate and assess data in order to provide an effective warning system.

16.   Most of the countries and territories in the Region are currently detecting signals from indicator-based surveillance systems through manual processes performed by humans, including collection, analysis, and interpretation of data. Priority should be given to the use of appropriate technologies, including technologies adapted to the needs of developing countries, to allow a process with automated steps to reduce the workload of surveillance officers and ensure early detection.

17.   Advanced analytics, such as nowcasting and forecasting, geospatial analysis, pathogen evolution tracking, and remote sensing data, have been used to strengthen early warning of outbreaks, epidemics, and pandemic-prone diseases. The triangulation of information provided by these tools with data from indicator-based, event-based, and community-based surveillance to identify patterns and project trends and unusual events has also been useful for risk assessment and early warning.

Proposal

18.   The aim of this strategy is to guide and support Member States in strengthening epidemic intelligence in the Region for early warning of health emergencies. The strategy, which will build on existing mandates and plans and on the experience of the PASB and Member States, includes the following four strategic lines of action.

Strategic Line of Action 1: Strengthen coordination and leadership for epidemic intelligence for early warning and monitoring of acute public health events and emergencies

19.   This strategic line of action is premised on PAHO and partners working together for the early detection, verification, assessment, reporting, and prompt response to public health events, outbreaks, and emergencies. Each Member State in which the strategy is to be implemented will need to assess its existing epidemic intelligence capacities and identify areas to be strengthened. As part of essential public health functions, it is imperative to have structured epidemic intelligence coordination and leadership mechanisms for early warning and monitoring of acute public health events and emergencies to ensure efficient implementation of epidemic intelligence activities within the Region.

20.   The Bureau will support the development of regional and national guidelines and standard operating procedures for epidemic intelligence activities, in accordance with national laws and contexts and local needs, and made available in all official languages of PAHO. Strengthening coordination and leadership for epidemic intelligence should help to identify public health priorities to be monitored within each country. PASB will also support the identification and equitable inclusion of relevant stakeholders for the implementation of epidemic intelligence activities across different sectors, including the human, animal, and environmental health sectors in the context of a One Health approach, taking into consideration different population groups, including Indigenous Peoples, Afro-descendants, and migrants. PASB will form multidisciplinary teams to implement the strategy and will support Member States in applying a comprehensive One Health approach to epidemic intelligence, leveraging various information channels and data sources to enhance early warning and rapid sharing of information about health risks. By building these coordination and governance frameworks for epidemic intelligence, Member States will have an opportunity to respond to health emergencies in a more effective and timely manner.

21.   As part of strengthening coordination for epidemic intelligence, PASB will include a combination of different surveillance approaches, data sources and visualization tools, analytical methods, and processes to enhance prevention measures and threat detection and assessment (including during public health emergencies of international concern and mass gatherings) and inform decision-making and international reporting during public health events, outbreaks, and emergencies. PASB will support Member States in identifying the best approaches for strengthening epidemic intelligence for early warning, emphasizing the need for accurate stakeholder mapping. In some countries, a combination of approaches, including locally tailored approaches, will need to be used, based on gap analyses of the existing surveillance system in order to identify where event-based surveillance approaches and available resources can best be utilized to reinforce early warning. Whenever possible, priority should be given to strengthening existing indicator-based surveillance components by promoting greater timeliness, extending geographical coverage, and increasing sensitivity and specificity.

Strategic Line of Action 2: Strengthen technical capacity for effective and sustained implementation of epidemic intelligence

22.   Strengthening technical capacity is key to the effective and sustained implementation of epidemic intelligence activities. Public health officers should be trained to gather, manage, analyze, and interpret disparate information from various surveillance systems. PASB will develop the basic profile required for human resources who will be involved in the implementation of epidemic intelligence activities and will support training sessions by experts from different disciplines and/or in-service training on epidemic intelligence, including detection, risk assessment, and verification activities. This training will include practical experience in outbreak investigation, which should be implemented in a sustainable way. Simulation exercises are valuable, as they provide staff hands-on training to test detection, verification, assessment, and event management communication systems and protocols and encourage coordination and cooperation.

23.   It is essential to systematize the evaluation and compilation of lessons learned on epidemic intelligence processes during the management of past public health events. Mechanisms for ensuring retention and continuity of knowledge and expertise should be considered. Such mechanisms might include training of public health officers at local and national levels, implementation of regular recurrent training programs, and establishment of linkages with existing field epidemiology programs.

24.   To build technical capacity, an electronic data management system (software and hardware) for early warning and response is critical to facilitate public health event management. The system should cover signal detection, verification, and assessment and should use reliable information technology tools and include geospatial analysis capabilities. It should be implemented and maintained for use at all levels in order to support and facilitate the entire event management process and to inform and record key decisions and actions taken in response to events. PASB will continue supporting Member States in providing technological tools for event management based on needs.

Strategic Line of Action 3: Improving the integration and interoperability of systems and tools to enhance epidemic intelligence

25.   Improving the integration and interoperability of health information systems, including indicator-based and event-based surveillance systems, can aid health authorities in rapidly detecting public health threats in a timelier manner. The integration of advanced analytics, such as nowcasting and forecasting, along with automated methods and tools, can expedite the processing of epidemic intelligence data, thereby facilitating early threat identification, decreasing the workload of epidemic intelligence officers, and more effectively supporting government decision-making. While the implementation of these methods and tools will require investment in technical infrastructure and training, along with dedicated human resources, the use of available open-source platforms and software can reduce costs and enhance sustainability. Integrating teams from public health institutions, academic groups, the private sector, and the community as well as adopting a One Health approach can enhance forecasting and nowcasting capacities and improve risk assessment. PASB will support Member States in strengthening advanced analytical capacity for use during emergencies.

26.   Based on gap analysis, PASB should expand and enhance capacity for event-based surveillance (including detection of public health signals from unstructured online information, such as social media and rumor monitoring); community-based surveillance; and collection of geospatial, remote sensing, and mobile phone data to improve the sensitivity of surveillance systems and facilitate early detection of new events, in line with applicable privacy legislation within Member States. Specialized tools, such as EIOS, should be expanded to facilitate automated processes for the collection and filtering of signals from event-based surveillance and to strengthen, systematize, and adequately analyze rumor monitoring data. Tools for capturing, filtering, and analyzing information from community-based surveillance require further development. Signal detection from indicator-based surveillance should also be enhanced to adapt to evolving public health threats, leveraging technologies—based on an analysis of capacity gaps and the degree of maturity of health information systems—to automate processes and reduce the workload of epidemic intelligence officers.

27.   Promoting interoperability among different databases and health information surveillance systems is essential, as is addressing relevant governance issues at the national and local levels. The Plan of Action for Strengthening Information Systems for Health 2019–2023 *(14)*, for which an assessment of gaps and identification of needs to enhance epidemic intelligence for early warning was conducted, and the Roadmap for the Digital Transformation of the Health Sector in the Region of the Americas *(15)* both encourage the use of open and interoperable digital information and health systems and the integration of national and local systems, which would facilitate efficient detection, analysis, verification, and assessment of health events.

Strategic Line of Action 4: Foster collaboration among surveillance institutions to share best practices, promote active engagement, strengthen information-sharing, and enhance rapid verification of public health signals

28.   As technologies and new knowledge advance rapidly, it is important to enhance international collaboration to share information and best practices in order to increase the timely detection and verification of signals and respond to public health threats before they become emergencies of international concern. This strategy will foster the exchange of procedures, practices, frameworks, and mechanisms, including tools and technologies for epidemic intelligence, as well as the development of a common set of terminologies and concepts to improve understanding of epidemic intelligence. It will also promote collaboration in relation to tools and procedures for signal detection, analysis, data-driven interfaces and dashboards, reports, and risk assessment. Cooperation between countries will be encouraged with a view to developing, implementing, and sustaining powerful predictive tools to adequately analyze events of importance to public health.

29.   The Bureau and Member States should work together to build a strong regional trust architecture, promote transparency, and enhance information-sharing for assessing risks and responding to public health events and emergencies. Collaboration should encompass communication of signals and other information about potential public health emergencies of international concern. Cross-border and international collaboration in order to tackle underreporting and increase early detection, warning, and response should also be enhanced, taking into account disease- and country-specific factors. National IHR focal points should be involved in regional collaboration efforts to ensure that relevant information channels are maintained.

Monitoring and Evaluation

30.   Performance and progress in implementing the strategy will be monitored and measured using the relevant outcome and output indicators from the PAHO program budgets and the Strategic Plan 2020–2025. A midterm review of progress achieved will be presented to the Governing Bodies in 2027, and a final report will be submitted in 2030.

Financial Implications

31.   The total estimated cost to implement this strategy, including personnel and activities, is US$ 15 000 000. It is expected that Member States will prioritize this issue and allocate resources toward the implementation of the strategy, as appropriate, in the context of the post-pandemic recovery. PASB will endeavor to mobilize additional resources to support Member States in implementing the strategy (see Annex B).

Action by the Executive Committee

32.   The Executive Committee is invited to review the information presented in this document, provide any comments it deems pertinent, and consider approving the proposed resolution presented in Annex A.

Annexes

References

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CE174/20

Proposed Resolution

**STRATEGY ON EPIDEMIC INTELLIGENCE
FOR STRENGTHENING EARLY WARNING OF HEALTH EMERGENCIES 2024–2029**

The 174th Session of the Executive Committee,

(PP)   Having reviewed the proposed *Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029* (Document CE174/20),

Resolves:

(OP)   To recommend that the 61st Directing Council adopt a resolution in the following terms:

**STRATEGY ON EPIDEMIC INTELLIGENCE
FOR STRENGTHENING EARLY WARNING OF HEALTH EMERGENCIES 2024–2029**

The 61st Directing Council,

(PP1)   Having reviewed the *Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029* (Document CD61/__);

(PP2)   Taking into account the importance of integrating epidemic intelligence operations within a comprehensive early warning mechanism that is able to promptly and effectively detect, verify, investigate, assess, and respond to public health threats and emergencies;

(PP3)   Bearing in mind the experience of the recent COVID-19 pandemic, which highlighted the need for rapid verification of signals of potential public health threats;

(PP4)   Recognizing the varying levels of implementation of epidemic intelligence among countries in the Region of the Americas and the importance of using different data sources to assess risks, as well as the need for rapid adaptation and continuous innovation to enhance early warning systems for health emergencies;

(PP5)   Considering that a key purpose of epidemic intelligence is to detect, verify, and assess public health risks as early as possible in order to mitigate and reduce their impact on populations;

(PP6)   Acknowledging that, as health threats and their drivers change and novel threats emerge, epidemic intelligence must continuously improve in order to ensure early detection and response,

Resolves:

(OP)1. To approve the *Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029* (Document CD61/__).

(OP)2. To urge all Member States, considering their national contexts, needs, vulnerabilities, and priorities, to:

a)   promote the implementation of the strategic lines of action set out in the strategy;

b)   strengthen technical capacity for conducting epidemic intelligence activities aimed at promptly detecting, verifying, assessing, reporting on, and responding to public health emergencies of national and international concern;

c)   build capacity and participate in defining best practices, based on scientific evidence on epidemic intelligence, fostering coordination and collaboration across various sectors and disciplines, and developing standardized terminology and concepts to enhance comprehension and effectiveness in epidemic intelligence efforts.

(OP)3. To request the Director to:

a)   provide technical cooperation to Member States to strengthen capacities that will contribute to the implementation of the strategy and the achievement of its objectives;

b)   promote the dissemination of lessons learned and good practices in epidemic intelligence, leveraging the advancements achieved within the Region;

c)   report periodically to the Governing Bodies of the Pan American Health Organization on the progress made and the challenges faced in the implementation of the strategy through a midterm review in 2027 and a final report in 2030.

Analytical Form: Programmatic and Financial Implications

1.	**Agenda item:** 4.9 – Strategy on Epidemic Intelligence for Strengthening Early Warning of Health Emergencies 2024–2029
2.	**Responsible unit:** Health Emergency Information and Risk Assessment, Department of Health Emergencies
3.	**Preparing officers:** Dr. Ciro Ugarte, Dr. María Almirón, Dr. Pilar Ramón-Pardo, Dr. Raul Fernando García Acevedo, Dr. Florence Heuschen, and Ms. Krista Swanson
4.	**List of collaborating centers and national institutions linked to this Agenda item:** The implementation of this strategy will require multisectoral, inter-country, and interprogrammatic cooperation and collaboration, as well as the strengthening of alliances with partners at all levels. These partners include: • Ministries and national government agencies, including national public health institutes responsible for detecting, verifying, and assessing public health risks • The 35 national International Health Regulations focal points • PAHO/WHO collaborating centers, including the following: WHO Collaborating Centre for Knowledge Translation and Health Technology Assessment for Health Equity; WHO Collaborating Center for Global Health Security, WHO Collaborating Center for Implementation of IHR Core Capacities, PAHO Collaborating Center for Emerging and Reemerging Arboviruses and other Emerging Zoonotic Viruses, WHO Collaborating Centre for Surveillance, Epidemiology and Control of Foodborne Diseases and Enteric, Fungal Pathogens • Centers for Disease Control and Prevention, United States of Americas • The WHO Hub for Pandemic and Epidemic Intelligence: https://pandemichub.who.int/ • The Epidemic Intelligence from Open Sources Initiative: https://www.who.int/initiatives/eios
5.	**Link between Agenda item and the Sustainable Health Agenda for the Americas 2018–2030:** Goal 1: Expand equitable access to comprehensive, integrated, quality, people-, family-, and community-centered health services, with an emphasis on health promotion and illness prevention Goal 2: Strengthen stewardship and governance of the national health authority, while promoting social participation Goal 3: Strengthen the management and development of human resources for health (HRH) with skills that facilitate a comprehensive approach to health Goal 5: Ensure access to essential medicines and vaccines, and to other priority health technologies, according to available scientific evidence and the national context Goal 6: Strengthen information systems for health to support the development of evidence-based policies and decision-making Goal 7: Develop capacity for the generation, transfer, and use of evidence and knowledge in health, promoting research, innovation, and the use of technology

Goal 8: Strengthen national and regional capacities to prepare for, prevent, detect, monitor, and respond to disease outbreaks and emergencies and disasters that affect the health of the population

Goal 10: Reduce the burden of communicable diseases and eliminate neglected diseases

Goal 11: Reduce inequality and inequity in health through intersectoral, multisectoral, regional, and subregional approaches to the social and environmental determinants of health

6. **Link between Agenda item and the [Strategic Plan of the Pan American Health Organization 2020–2025](#):**

This strategy will contribute to the achievement of the following outcomes of the PAHO Strategic Plan 2020–2025:

Outcome 4: Response capacity for communicable diseases

Outcome 8: Access to health technologies

Outcome 9: Strengthened stewardship and governance

Outcome 12: Risk factors for communicable diseases

Outcome 17: Elimination of communicable diseases

Outcome 18: Social and environmental determinants

Outcome 20: Integrated information systems for health

Outcome 21: Data, information, knowledge, and evidence

Outcome 22: Research, ethics, and innovation for health

Outcome 23: Health emergencies preparedness and risk reduction

Outcome 24: Epidemic and pandemic prevention and control

Outcome 25: Health emergencies detection and response

Outcome 27: Leadership and governance

7. **Time frame for implementation and evaluation:** This strategy covers a five-year period, from 2024 to 2029, with a midterm review in 2027 and a final report in 2030.

8. **Financial implications:**

   a) **Total estimated cost for implementation over the lifecycle of the resolution (including staff and activities):**

Areas	Estimated cost
Human resources	2 000 000
Training	1 500 000
Consultants/service contracts	1 250 000
Travel and meetings	1 100 000
Publications	150 000
Technological tools and other expenses	9 000 000
Total	15 000 000

It is anticipated that over 90% of the total cost can be financed through voluntary contributions from Member States or grants from philanthropic institutions.

b) **Estimated cost for the 2024–2025 biennium (including staff and activities):**

The estimated cost for the biennium is approximately US$ 5 000 000. It is estimated that two existing staff (P-4/5) will contribute 25% of their time to the implementation of the strategy in the 2024–2025 biennium and that a new, full-time technical advisor position (P-4) will be needed to implement the strategy.

c) **Of the estimated cost noted in** *b)* **above, what can be subsumed under existing programmed activities?**

Approximately US$ 3 000 000, which will be covered with PAHO regular funds and activities, and voluntary contributions.

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