

# COVID-19 and the importance of strengthening Information Systems

| DIGITAL TRANSFORMATION TOOLKIT  
*KNOWLEDGE TOOLS*

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# PAHO



Pan American  
Health  
Organization



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Americas

## COVID-19 and the importance of strengthening Information Systems

**IMPORTANT NOTE:** Stay informed with timely information on the Coronavirus Disease (COVID-19), available on the [PAHO](#) and [WHO](#) websites and through your national and local public health authorities

### Why are information systems key for pandemic response?

During a pandemic, more than in any other public health situation, information systems play a critical role in managing data and other information at the speed the situation requires. They provide essential evidence for taking action, making the most informed decisions possible, and adjusting policies to allow for better intelligence on actions to improve health. Emerging technologies and automation have the potential to improve public health like never before in the history of humankind.

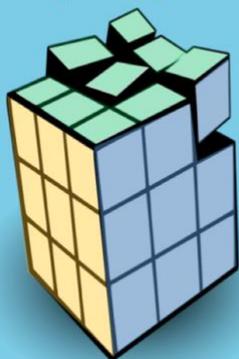
Information systems provide immediate, expeditious, and coordinated data access and sharing, and they facilitate the prioritization of care, access, and response, especially for people in conditions of vulnerability. With properly disaggregated health data, it is possible to plan actions that reduce potential health inequities at all levels of care, and facilitate the implementation of strategies to address such inequities.

**Better information systems for health mean better health outcomes and continuity of care, so that all people receive the best possible medical care over time.**

### What are the main areas to prioritize?

**Governance of information systems:** Establish or strengthen: mechanisms and processes connected with the effective use of information technology, and with the production, management, and processing of the data needed for response; infrastructure for Internet access; regulations and standards for the development or adoption of computer applications and databases; a process for capacity building, and the review and updating of legislation. It is important that there be a person, entity, or group devoted exclusively to managing information systems (including data capture, analysis, and dissemination) and acting as a liaison between the institution and its suppliers of technology, infrastructure, etc.

#### Strengthening information systems: key areas to prioritize



- Governance
- Multisectoral management
- Technology infrastructure
- Automatization and interoperability of electronic health records
- Privacy, confidentiality, and security of data
- Data and information processing
- Knowledge management and sharing
- Innovation

**A multisectoral management mechanism:** Formally establish a transparent and strategic multisectoral governance structure or mechanism to devise a framework for action, a strategic plan, and a national road map that include prioritizing activities, allocating funds, and adopting standards for technological applications.

#### Technological infrastructure:

Have secure technological infrastructure that meets the needs. At a minimum, this should allow for: data capture and analysis platforms; real-time dissemination of information; electronic health records; patient

portals; and the establishment of appropriate communication channels for teleconsultation (workstations and Internet access with sufficient bandwidth for multimedia services). Image compression algorithms could potentially be used when working in conditions of poor connectivity.

**Automation and interoperability of electronic health records:** Automate or boost the capacity of the various existing systems to communicate with each other; to accurately, effectively, and systematically exchange data; and to make immediate use of information in an appropriate format.

**Data privacy, confidentiality, and security:** Strengthen technological infrastructure and regulations to improve data confidentiality, security, and privacy, prevent unauthorized access to and improper use of patient information, and ensure data integrity and compliance with standards and regulations on data protection. It is important that this be addressed jointly by health experts, lawmakers, and information technology specialists. Reference standards include ISO 27001, 27002, and 27799.

**Data and information processing:** Implement or strengthen the national platform for sharing health information in order to promote effective and rapid data collection, prioritization, and mapping, using an automated, systematic process that can be adapted to differing information needs. Prioritize case investigation, contact tracing, mapping of transmission chains, and secure sharing of data and information on the system and available resources, such as beds, human resources, supplies, and equipment (see confidentiality issues).

**The availability of critical data and agile information systems are factors for success in combating the pandemic.**

**Knowledge management and sharing:** Facilitate the participation of the scientific and academic community as well as civil society in real-time data production and analysis through timely access to accurate information in the appropriate format. Establish mechanisms (forum, website for knowledge sharing, mailing lists, etc.) to share new knowledge, document good practices and lessons learned, and combat disinformation and the “infodemic”. Share reliable information with the public and help people understand the disease.

**Innovation:** To the extent possible, incorporate tools and applications that can improve data access and availability, and real-time analysis and presentation of data, using different analytical approaches and developing predictive models that enable better planning, response, and decision-making in health services and systems.

### **What is most important to consider with a view to strengthening information systems?**

One key element is having the critical data required to generate reliable information, preferably with some degree of disaggregation (see factsheet footnote on data disaggregation). This information must be sufficient to enable health services to respond to the specific needs of the population, including continuity of care for preexisting or new health conditions, and of course, pandemic-related problems. Access to information on preexisting conditions significantly improves case management, especially for high-risk patients, facilitating the inclusion of variables necessary for measuring inequities in decision making.

### **What would be the ideal scenario for information systems in response to the pandemic?**

#### **Technological infrastructure**

- Establish the necessary infrastructure and procedures to achieve the greatest possible interoperability in health information platforms, relying on multiple sources, including subnational databases.
- Ensure connectivity with sufficient bandwidth for the transmission of images and real-time communication (e.g., physician/patient, second medical opinion, training).

## **Organizational structure**

Implement or strengthen an operational structure for information systems to:

- Coordinate actions for data processing and database maintenance; adoption, adaptation, or acquisition of software; development of applications; infrastructure maintenance; and support for users.
- Provide methods and technologies for the analysis and visualization of data and information.
- Identify and propose the adoption of international standards for data privacy, confidentiality, and security.
- Identify and address needs and possible gaps in the implementation of information systems for health in the context of pandemic response.
- Support the implementation of applications for use in telehealth and electronic health records.

## **Multisectoral collaboration**

- Formalize mechanisms to integrate all sectors involved in the response in order to cover specific needs related to the collection, access, and dissemination of information, including the private sector and civil society.

## **Investment priorities**

- Establish a road map that contains an investment plan aligned with the prioritization given to information systems that support the pandemic response.
- Determine what health information system activities for COVID-19 are critical and should be prioritized in the annual budgets of the national health authorities.
- Consider public-private collaboration focused on investments that have social impact and on corporate social responsibility.
- Identify available financial resources and initiate extraordinary activities to mobilize resources to cover possible funding gaps.
- Where loans have been approved or are being negotiated, establish roundtables for dialogue in order to redirect funds to strengthen information systems.

## **Human resources**

Implement professional training for digital literacy in health workers, among others, in these areas:

- Technologies commonly used in pandemic response ([see ICT factsheet](#))
- Telehealth ([see Telepresence factsheet](#))
- Electronic health records ([see EHR factsheet](#))
- Data processing, including analysis, visualization, and disaggregation ([see Disaggregated Data factsheet](#))
- Proficiency with virtual communication tools and online learning

## **Legislation**

Implement a process for rapid analysis, drafting, and updating of legislation and critical regulations to support pandemic response, fully incorporating ethical use and protection of health data, primarily concerning:

- Privacy
- Security
- Secondary use
- Facilitating effective use of electronic health records, teleconsultation, and electronic medical prescriptions (validation and digital signature)
- Adoption of new technologies for georeferencing, especially in relation to the use of applications for monitoring individuals.

## Dissemination of information

- Establish mechanisms, roles, and responsibilities for disseminating data and information to diverse audiences
- Analyze the metrics of information use to evaluate, define, and adjust dissemination strategies
- Participate actively in combatting the infodemic ([see Infodemic factsheet](#))

## What **mechanisms and tools** are available to accelerate the process of **strengthening information systems for health**?

### Tools of the Pan American Health Organization

#### Managerial Instruments

- [IS4H Maturity Assessment Planning Guide](#)
- [Short to Medium-Term IS4H Roles](#)
- [National Information Systems for Health Steering Committee and Technical Advisory Groups](#)
- [Developing a National eHealth Strategy](#)
- [Functional Assessment Consultancy Terms of Reference](#)
- [ICT Assessment and Costing Consultancy Terms of Reference](#)
- [Post Description: IS4H Manager](#)

#### Technical Documents

- [IS4H Maturity Assessment Levels](#)
- [Data Management Policy](#)
- [Data Governance Framework](#)
- [IS4H Guiding Principles](#)
- [IS4H Monitoring and Evaluation Framework](#)
- [IS4H Maturity Model Institutional Tools](#)
- [Maturity Model Country Tool \(questionnaire\)](#)
- [Maturity Model Country Tool](#)

#### Knowledge Capsules

- [Technology Readiness in Public Health](#)
- [Interoperability in Public Health](#)
- [Data Governance in Public Health](#)
- [Information Architecture in Public Health](#)

#### Knowledge management methodologies

- [How to develop functionally within the Information Society](#)
- [How to develop virtual discussion forums effectively](#)
- [Building Communities of Practice](#)
- [Lessons learned](#)
- [How to conduct effective virtual meetings](#)
- [How to start writing a scientific article](#)
- [How to improve scientific writing in public health](#)
- [How to organize and preserve the institutional memory](#)

### Tools of the Inter-American Development Bank

- [Buy, Build, or Adapt – How to decide? A Guide to Open Source Electronic Health Records \(EHRs\) nica compartida \(EHR\) de código abierto](#)
- [Detect, Prevent, Respond, Recover Digitally: Evidence from Applying Digital Interventions to Past and Present for Future Public Health Emergencies](#)
- [From Information To Intelligence: How To Adapt Institutions For Data Analysis In Government](#)
- [The ABC of social services interoperability: Guide for governments](#)

- [How Can Artificial Intelligence Help In A Pandemic?](#)

### **Where can I read more about strengthening information systems?**

- <https://www.paho.org/ish/index.php/en/>
- <https://www.measureevaluation.org/resources/tools/health-information-systems-interoperability-toolkit>
- <https://www.measureevaluation.org/his-strengthening-resource-center/his-strengthening-model/his-performance>

### **Contact information**

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