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C. PLAN OF ACTION FOR STRENGTHENING INFORMATION SYSTEMS FOR HEALTH 2019-2023: PROGRESS REPORT

Background

1. In 2017, the 29th Pan American Sanitary Conference of the Pan American Health Organization (PAHO) approved the Plan of Action for Strengthening Vital Statistics 2017-2022 (Document CSP29/9) *(1)* and requested the Pan American Sanitary Bureau (PASB) to prepare a plan of action on information systems for health.

2. The purpose of this document is to report to the Governing Bodies of the Pan American Health Organization (PAHO) on progress made toward implementation of the Plan of Action for Strengthening Information Systems for Health 2019-2023 (Document CD57/9, Rev.1) *(2)*, approved in 2019 by the 57th Directing Council of PAHO. This subject was incorporated in the new Strategic Plan of the Pan American Health Organization 2020-2025 *(Official Document 359) (3)*.

3. The countries of the Region of the Americas continue to make considerable progress in strengthening information systems for health (IS4H). However, the COVID-19 pandemic has given rise to some major challenges, as well as the need to accelerate digital processing so that the data produced are reliable, protected, available on a timely basis, and in the proper format to be used as evidence for decision-making, for policy formulation, monitoring, and evaluation, and for the production of intelligence for health action.

Analysis of Progress Achieved

4. Since approval of the plan of action, countries and territories in the Region of the Americas have made considerable progress in information system management and governance, data management and digital solutions, information and knowledge management for health, and innovation.

5. Between November 2016 and June 2021, PASB and the Member States analyzed the level of maturity of information systems in the countries and territories of the Region. The results of these analyses are the basis for current investments by associated technical and financial institutions such as the Inter-American Development Bank, and for the

creation or updating of road maps and public policies. In the evaluation of regional maturity, detailed results were obtained and organized around four strategic lines of action.

6. The analysis of progress under the plan of action focused on challenges, opportunities, and good practices. Consideration was given to technology tools and regulatory instruments, standards for electronic health records, identification and classification of information products, and technology infrastructure, as well as the definition, classification, and integration of health data sources, including both structured and unstructured data. Attention was also given to active participation by the scientific and academic community, civil society, and information producers and users in the real-time collection or capture of data and information, as well as facilitating access to accurate information at the right time and in the right format *(4)*.

7. In light of existing initiatives and an *ex post* evaluation of the four years of execution of the IS4H initiative, as well as the need to accelerate digital transformation in the health sector and strengthen information systems for health in the Region, PASB, together with the Member States, called for action in 2021 to ensure that "no one is left behind" in the age of digital interdependence *(4)*.

Strategic Line of Action 1: Information system management and governance

8. Several countries made considerable progress in the indicators related to strengthening the governance of information systems for health, especially in areas related to the improvement of legal frameworks for facilitating the implementation of electronic health records, electronic prescriptions, and telehealth or telemedicine, among others. Plans and strategies have been developed for information systems for health, digital health, and digital transformation in health care that establish the duties and responsibilities of the actors involved and emphasize leadership. Some countries in the Region have initiated or improved the digitization of their health systems and incorporated norms and standards for interoperability with a view to improving the transmission of and access to information.

Objective 1.1: Strengthen the management and governance mechanisms of information systems for health	
Indicator, baseline, and target	**Status**
1.1.1 Number of countries and territories that have implemented a governance mechanism (policy, plan of action, or strategy) for information systems for health Baseline (2019): 5 Target (2023): 10	Eight countries have implemented a governance mechanism (policy, plan of action, or strategy) for information systems for health. An additional 10 countries and four territories expect to implement one by 2023, which means that the established target would be exceeded.

Objective 1.1: Strengthen the management and governance mechanisms of information systems for health	
Indicator, baseline, and target	**Status**
1.1.2 Number of countries and territories that have used the PAHO model to determine the maturity of their information systems Baseline (2019): 5 Target (2023): 15	The PAHO model to determine the maturity of information systems for health has been applied in all the countries and territories of the Region of the Americas. As a result of changes prompted by the pandemic and progress in digital transformation, 10 countries and three territories have expressed the need to update their studies, and four countries have convened national workshops to discuss and formulate updated road maps.
1.1.3 Number of countries and territories that have a regulatory framework that supports the use, management, and exchange of data and information through electronic media and addresses the aspects of dissemination, access, privacy, ethics, interoperability, and domain or property Baseline (2019): 0 Target (2023): 10	Five countries and two territories have a regulatory framework that supports the use, management, and exchange of data and information through electronic media and addresses the aspects of dissemination, access, privacy, ethics, interoperability, and domain or property. Five more countries expect to have developed such a regulatory framework by 2023.
1.1.4 Number of countries and territories that have developed their health information architecture with emphasis on the flow and processing of relevant data for the health sector Baseline (2019): 0 Target (2023): 10	Eight countries have developed their health information architecture with emphasis on the flow and processing of relevant data for the health sector. Five more countries expect to define theirs by 2023, which means that the established target would be exceeded.
1.1.5 Number of countries and territories with a monitoring and evaluation framework for their information systems for health Baseline (2019): 0 Target (2023): 10	Six countries have a monitoring and evaluation framework for their information systems for health. Four more countries expect to have one by 2023.
1.1.6 Number of countries and territories with an interinstitutional committee for implementation of information systems for health Baseline (2019): 2 Target (2023): 10	Five countries have an interinstitutional committee for the implementation of information systems for health. Eight more countries expect to have one by 2023.

Objective 1.1: Strengthen the management and governance mechanisms of information systems for health	
Indicator, baseline, and target	**Status**
1.1.7 Number of countries and territories that have adopted national policies and created government or private sector electronic health record (EHR) portals with open data for health Baseline (2019): 15 Target (2023): 19	A total of 20 countries and three territories have adopted national policies and created government or private sector electronic health record (EHR) portals with open data for health. Five more countries expect to do so by 2023, which means that the established target would be exceeded.
1.1.8 Number of countries and territories that have implemented a national health data governance strategy or policy for continuous quality assurance, security, and confidentiality of data Baseline (2019): 0 Target (2023): 10	Two countries and one territory have implemented a national health data governance strategy or policy for continuous quality assurance, security, and confidentiality of data. There is no information on how many countries expect to implement one by 2023.
1.1.9 Number of countries and territories that have introduced methods and tools for the analysis of unstructured data for the benefit of public health Baseline (2019): 0 Target (2023): 10	Three countries have introduced methods and tools for the analysis of unstructured data for the benefit of public health. There is no information on how many countries expect to introduce them by 2023.
1.1.10 Number of countries and territories that report data disaggregated by age group, sex, and ethnicity at the national and subnational level Baseline (2019): 4 Target (2023): 15	A total of 10 countries report data disaggregated by age group, sex, and ethnicity at the national and subnational level. Five more countries expect to do so by 2023.

Strategic Line of Action 2: Data management and information technologies

9. Several countries have established programs or projects for the digitization, development, or implementation of technological solutions in such areas as follow-up and monitoring of patients, clinical histories, electronic prescriptions, and telehealth, among others. In addition, more countries have implemented technological solutions for visualizing data and information, and have recruited professionals and personnel specialized in various data and information analysis techniques. Cooperation and partnerships have been established between countries to facilitate the transfer of information and communication technologies. There was an overall rising trend in budgets allocated to improving technological infrastructure and connectivity among health institutions with a view to facilitating data collection and analysis.

Objective 2.1: Promote the development of interconnected and interoperable information systems	
Indicator, baseline, and target	**Status**
2.1.1 Number of countries and territories that have introduced standards to facilitate the interoperable exchange of data (e.g., Fast Healthcare Interoperability Resources - FHIR) Baseline (2019): 10 Target (2023): 15	Eight countries have introduced standards to facilitate the interoperable exchange of data. Seven more countries and three territories expect to adopt them by 2023.
2.1.2 Number of countries and territories that have set standards for the introduction of new information and communication technologies Baseline (2019): 10 Target (2023): 15	A total of 15 countries have set standards for the introduction of new information and communication technologies. An additional 10 countries and four territories expect to adopt them by 2023, which means that the established target would be exceeded.
2.1.3 Number of countries and territories with a national electronic health records system (for at least the public health sector) based on the use of unique identification numbers or patient matching utilizing health information technology Baseline (2019): 10 Target (2023): 18	A total of 10 countries have a national electronic health records system (for at least the public health sector) based on the use of unique identification numbers or patient matching utilizing health information technology. Eight more countries expect to have one by 2023.
2.1.4 Number of countries and territories that have developed or introduced a tool (data dictionary) to describe the type of data compiled in a database, their format and structure, and how they are used in the health system Baseline (2019): 2 Target (2023): 10	At total of 10 countries have developed or adopted a tool (data dictionary) to describe the type of data compiled in a database, their format and structure, and how they are used in the health system.
2.1.5 Number of countries and territories with formal standard operating procedures for secure access to data for health organizations (public and private) that allow patients to securely access their health data Baseline (2019): 2 Target (2023): 10	A total of 10 countries have formal standard operating procedures for secure access to data for health organizations (public and private) that allow patients to securely access their health data.

Strategic Line of Action 3: Information and knowledge management

10. In several countries, the Ministries of Health created closer formal ties with academic and research institutions to work on improving the analysis and production of information and knowledge. In addition, mechanisms and methodologies were developed for disseminating information at various levels: for professionals, health workers, decision-makers, and the general public. All countries moved forward in the use of digital tools to conduct virtual meetings and webinars—experiences that maintained and increased opportunities to continue working on and strengthening inter- and intra-institutional ties.

Objective 3.1: Promote the production and exchange of technical and scientific information to support the operation of information systems	
Indicator, baseline, and target	**Status**
3.1.1 Number of countries and territories that have adopted methodologies to document lessons learned, experiences, and good practices, and to promote the sharing of knowledge about the implementation of information systems Baseline (2019): to be determined Target (2023): 10	A total of 10 countries have adopted methodologies to document lessons learned, experiences, and good practices, and to promote the sharing of knowledge about the implementation of information systems.
3.1.2 Number of countries and territories in which academic institutions or professional associations participate in national committees to support the implementation of information systems for health Baseline (2019): 2 Target (2023): 5	In five countries, academic institutions or professional associations participate in national committees to support the implementation of information systems for health.
3.1.3 Number of countries and territories that participate in communities of practice to create information services or resources, ensuring that populations in conditions of vulnerability are taken into consideration Baseline (2019): 0 Target (2023): 10	A total of 10 countries participate in communities of practice to create information services or resources, ensuring that populations in conditions of vulnerability are taken into consideration.

Strategic Line of Action 4: Innovation, integration, and convergence

11. Some countries have formed subregional networks for exchanging knowledge about technological innovations. Examples include the Latin American and the Caribbean Network for Strengthening Health Information Systems (RELACSIS) and the American Network of Cooperation in the Development of eHealth (RACSEL). Others have incorporated key

performance indicators in their national plans and strategies on information systems for health and on the integration of digital health actions within the framework of e-government initiatives.

Objective 4.1: Establish a network of institutions and experts to advise PAHO and the Member States on the introduction of innovative models for the development of information systems	
Indicator, baseline, and target	**Status**
4.1.1 The Member States have formed a network to ensure the introduction of models and technologies that facilitate digital transformation in the health sector Baseline (2019): 0 Target (2023): 1	A total of 15 countries have formed a network to ensure the introduction of models and technologies that facilitate digital transformation in the health sector. Another 10 countries and four territories expect to participate by 2023.
4.1.2 The Member States have a standardized monitoring and evaluation framework consisting of a set of key performance indicators, as well as key objectives and outcomes for establishing, communicating, and periodically monitoring targets and outcomes in the implementation of information systems for health Baseline (2019): 0 Target (2023): 1	As part of the digital transformation toolbox, a standardized monitoring and evaluation framework has been adopted consisting of a set of key performance indicators, as well as key objectives and outcomes for establishing, communicating, and periodically monitoring targets and outcomes in the implementation of information systems for health. There are still no formal data on how many countries have adopted such a framework.
4.1.3 Number of countries and territories in which the health sector formally participates in e-government initiatives, including the introduction of standards for national use and global use (e.g., SNO-med), the optimization of investments in technology infrastructure, and the convergence of current initiatives and investments Baseline (2019): 4 Target (2023): 10	A total of 10 countries and one territory report that their health sector formally participates in e-government initiatives, including the introduction of standards for national use and global use (e.g., SNO-med), the optimization of investments in technology infrastructure, and the convergence of current initiatives and investments.

Objective 4.2: Improve human resource training in all aspects of information systems for health	
Indicator, baseline, and target	**Status**
4.2.1 Number of countries and territories with ongoing professional training strategies or digital literacy programs for the use of new technologies Baseline (2019): To be determined Target (2023): 5	Five countries have professional training courses or digital literacy programs for the use of new technologies.

Lessons Learned

12. The following are lessons learned under each of the strategic lines of action:

a) *Information system management and governance.* Improved strategic governance mechanisms in IS4H that ensure the convergence of investments and actions, as well as the integration and interoperability of databases and digital health solutions, have been a critical factor in facilitating access to reliable data, information, and knowledge on a timely basis, in the right place, and in the right format.

b) *Data management and information technologies.* Open, secure, and ethical access to reliable, disaggregated quality data is essential in order to strengthen decision-making and the presentation of transparent information. The automation process is necessary for improving the quality of information, with easy and timely access.

c) *Information and knowledge management*. Data and information for health should be supported by the greatest possible amount of verified evidence and knowledge. Countries have developed a variety of solutions for managing the data and information they obtain for their information systems for health.

d) *Innovation, integration, and convergence.* Countries need to be prepared to embrace rapid technological progress, including innovations to their information systems for health.

Action Needed to Improve the Situation

13. Based on the developments reported above and the analyses conducted together with the Member States *(4)*, the following measures are proposed for improving information systems for health under each of the strategic lines of action:

a) *Information system management and governance*. Adopt guiding principles, policies, and official governance mechanisms for the management of data and information, prioritizing multisectoral and interdisciplinary participation.

b) *Data management and information technologies.* Adopt international standards for data management and interoperability that prioritize technological infrastructure, automation, interoperability of electronic medical records, and the privacy, confidentiality, protection, and ethical use of data.

c) *Information and knowledge management*. Implement a digital literacy program as an ongoing mechanism for strengthening the skills of human resources working in the information society.

d) *Innovation, integration, and convergence*. Determine the maturity of the countries' information systems for health as a first step in identifying gaps and needs.

Action by the Executive Committee

14. The Executive Committee is invited to take note of this report and provide any comments it deems pertinent.

References

1. Pan American Health Organization. Plan of Action for the Strengthening of Vital Statistics 2017-2022 [Internet]. 29th Pan American Sanitary Conference, 69th Session of the Regional Committee of WHO for the Americas; 2017 Sep 25-29; Washington, DC. Washington, DC: PAHO; 2017 (Document CSP29/9) [cited 2022 Mar 2]. Available from: https://iris.paho.org/handle/10665.2/34445.

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4. Pan American Health Organization. From the evolution of information systems for health to the digital transformation of the health sector. [Internet]. IS4H conference report. Washington, DC: PAHO; 2021. Available from: https://iris.paho.org/bitstream/handle/10665.2/53364/PAHOEIHIS210006_eng.pdf.

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