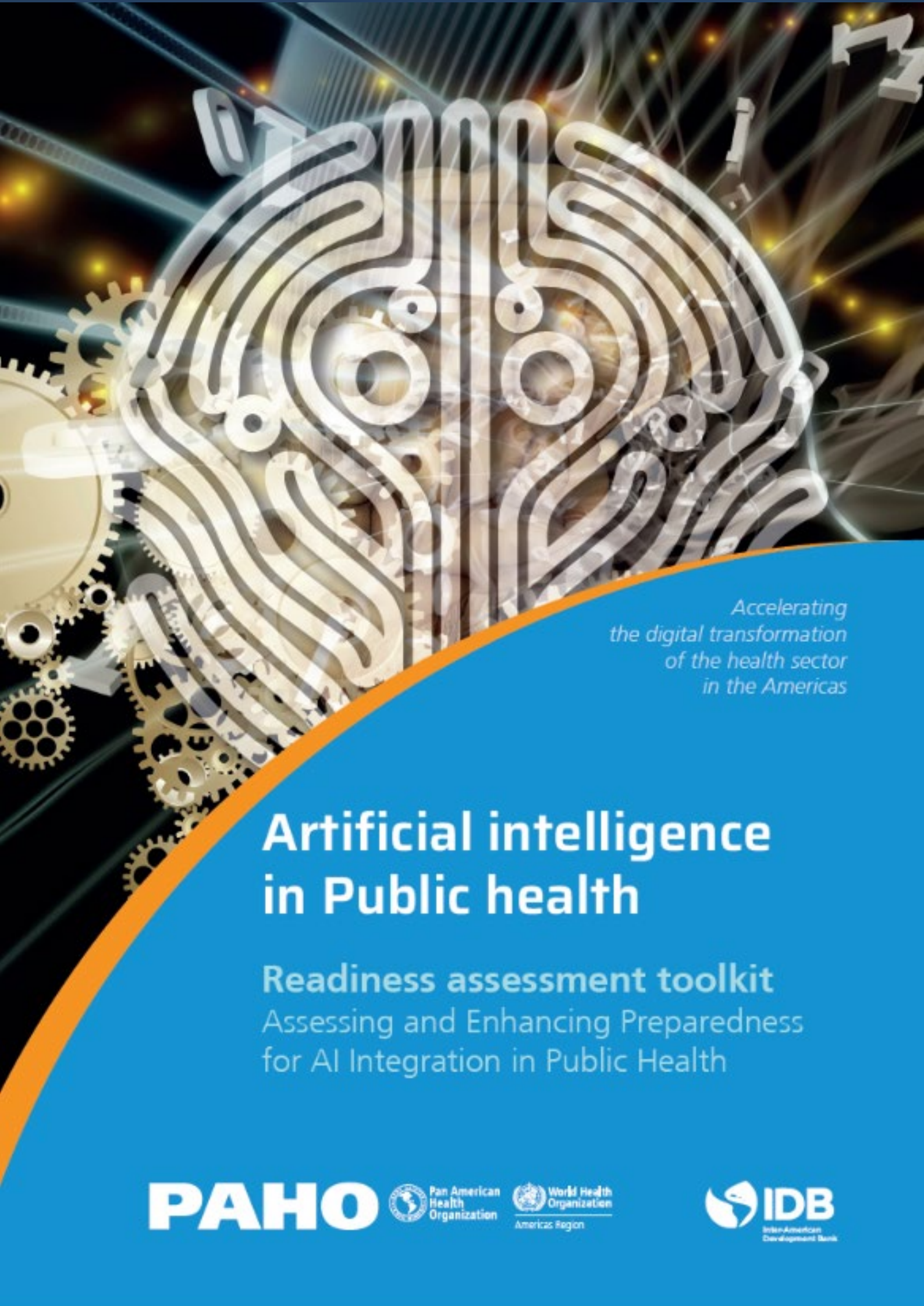




*Accelerating
the digital transformation
of the health sector
in the Americas*

Artificial intelligence in Public health

Readiness assessment toolkit
Assessing and Enhancing Preparedness
for AI Integration in Public Health

PAHO



Pan American
Health
Organization



World Health
Organization
Americas Region



IDB

Inter-American
Development Bank



Artificial Intelligence in Public health

Readiness assessment toolkit

Assessing and Enhancing Preparedness for AI Integration in Public Health

Version 2.0

This tool provides a structured approach to assess the readiness of a country to implement AI projects in public health. Each question is designed to facilitate discussions and planning by identifying strengths and areas for improvement.

ORGANIZATION, COORDINATION AND DEVELOPMENT

Information Systems and Digital Health Unit (EIH-IS), Department of Evidence and Intelligence for Action in Health (EIH), PAHO/WHO
Digital Health Team; Social Protection and Health Division (SPH), IDB



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Artificial Intelligence in Public health

Readiness Assessment Toolkit



"Artificial intelligence (AI) is rapidly transforming public health, offering powerful tools to modernize health systems and services. AI promises to improve health outcomes, enhance efficiency, and drive innovation.

PAHO is deeply committed to supporting all Member States in integrating AI into their public health systems. Embracing AI in public health is a collective effort to ensure no one is left behind."

Dr. Jarbas Barbosa
Director, PAHO/WHO



"We are promoting AI at the InterAmerican Development Bank...[and]our vision to unravel AI's enormous potential both at the bank as well in our region. Strengthening institutions and governance, investing in data and infrastructure and, importantly, people's skills will be key to reap the benefits of AI in the public and private sectors."

Ilan Goldfajn
President of the Inter-American
Development Bank

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Introduction

The goal of this assessment tool is to facilitate a thorough and structured evaluation of a governments' readiness for AI in public health, fostering informed decision-making, strategic planning, and targeted investments. This tool also aims to support governments in building a robust foundation for successful AI integration in their health systems, ultimately enhancing public health outcomes and operational efficiency. It provides a comprehensive structure for assessing various dimensions of AI readiness. It highlights critical aspects such as governance, infrastructure, workforce, data management, funding, public engagement, implementation, and evaluation. It was designed with a holistic approach for supporting a country's preparedness for AI integration in public health.

Key to its effectiveness is the evaluation framework that guides institutions through a series of questions, each designed to highlight strengths and areas for improvement. The assessment presents essential categories, from

existing health care infrastructure and digital health landscapes to data availability and quality, health workforce readiness, and regulatory frameworks. Each question uses a rating system, allowing respondents to indicate their level of agreement or the current state on a scale from 1 to 4.

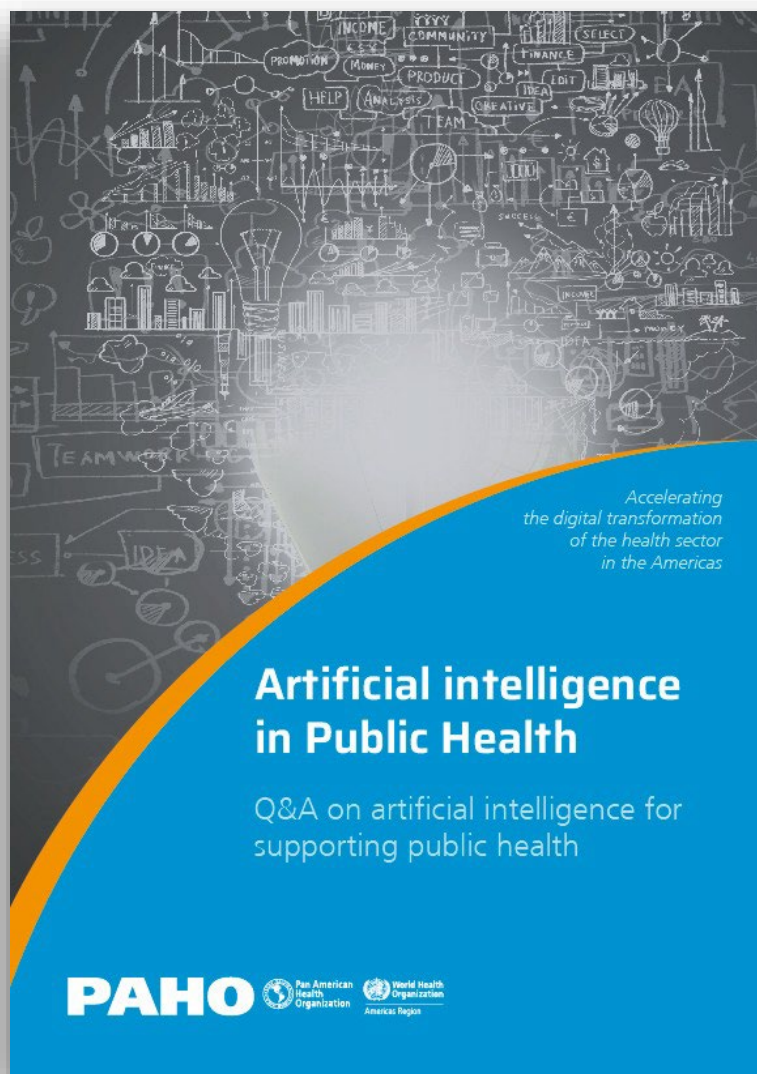
The tool begins with a series of kick-off questions focused on fundamental and foundational areas such as health care needs and priorities, the state of existing health care infrastructure, the digital health landscape, data availability, health workforce readiness, and regulatory frameworks. These questions set the stage for a deeper exploration of readiness.

Beyond these initial queries, the tool also addresses supplemental areas like public awareness and education, funding and resources, and stakeholder engagement. This comprehensive approach ensures that all critical aspects of AI readiness are covered, providing a well-rounded assessment.

PAHO and IDB are deeply committed to supporting all Member States in their journey toward integrating AI into public health systems. Recognizing the transformative potential of AI, PAHO and IDB, in collaboration with other partners, provides technical cooperation, resources, and guidance to help countries build the necessary infrastructure, develop robust regulatory frameworks, and enhance workforce capabilities. PAHO and IDB aim to ensure that all member states can effectively harness AI to improve public health outcomes and operational efficiencies.

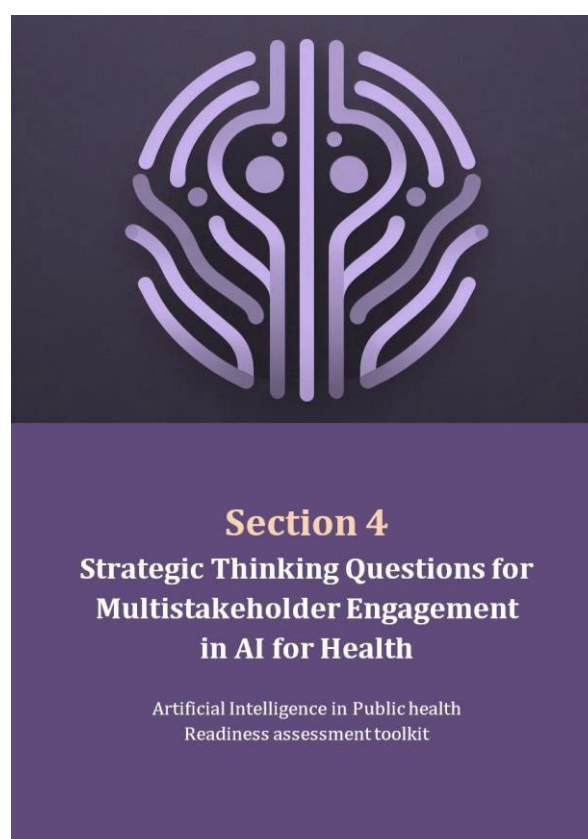
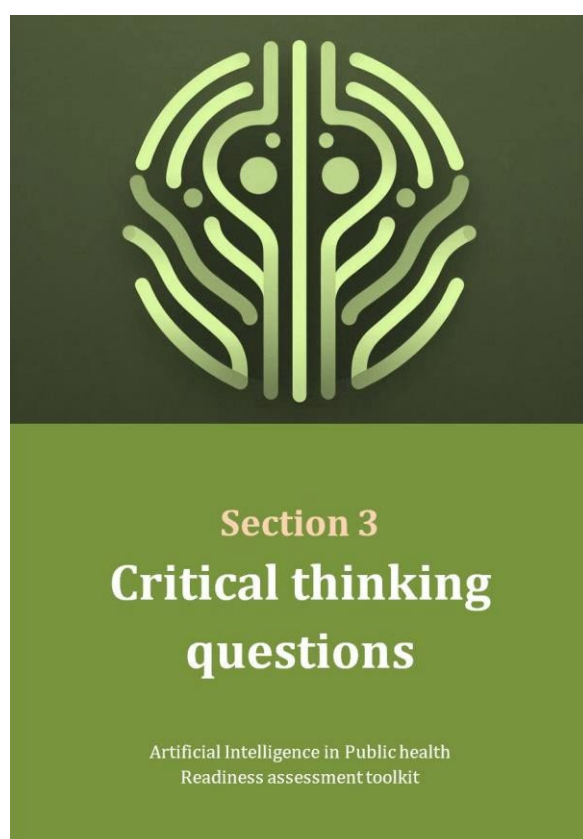
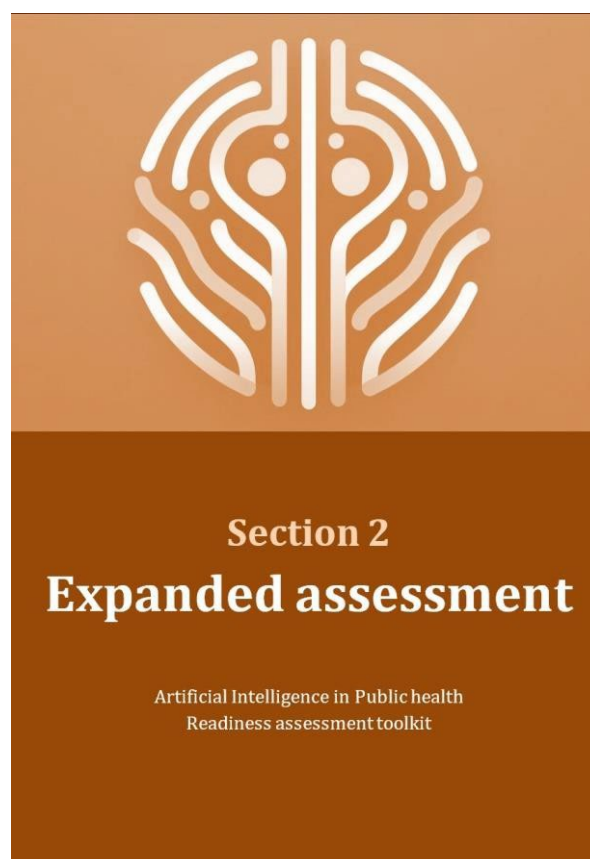
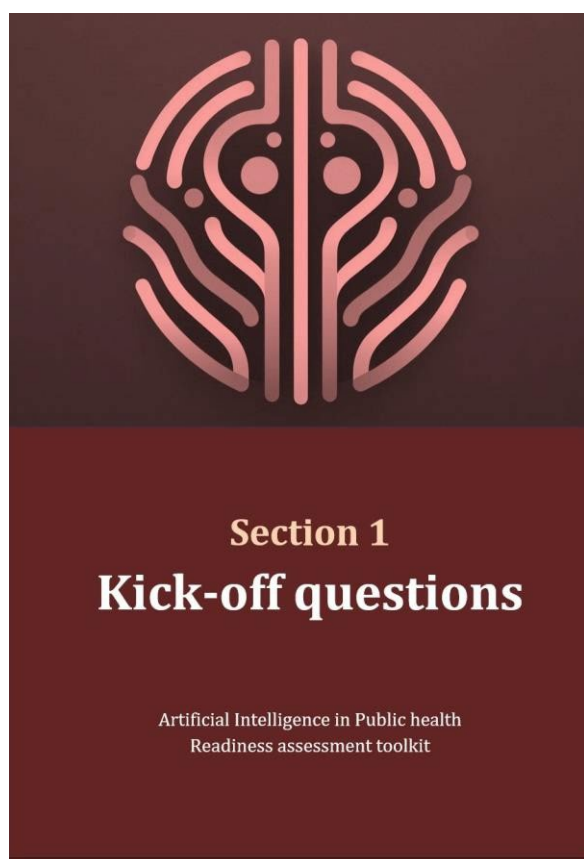
The AI Readiness Assessment Toolkit is designed to help governments evaluate and enhance their capacity for integrating AI into public health systems, driving informed decision-making, strategic planning, and improved public health outcomes

This tool is an integral part of PAHO's Digital Transformation Toolkit and aligns with the implementation of the [Eight Guiding principles of Digital Transformation in Health](#). It embodies the [Regional Roadmap for the Digital Transformation of the Health Sector](#), which has been agreed upon and approved by all Member States. These principles provide a strategic framework to ensure that digital health initiatives are equitable, sustainable, and impactful, guiding countries as they navigate the complexities of integrating advanced technologies like AI into their public health systems. Through this tool, PAHO reinforces its commitment to supporting the digital evolution of health sectors across the region, ensuring that every country can achieve improved health outcomes through innovative digital solutions.



Document available at: <https://iris.paho.org/handle/10665.2/59315>

Toolkit Structure





Section 5

**Critical Considerations for a Successful
AI Implementation in the Health
Sector**

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Section 6

Guiding principles

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Section 7

Key concepts

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Section 8

Official documents and reports

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Section 9
**OKRs for the First Year of AI
Implementation at the National Level**

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Section 10
Implementation Roadmap

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Section 1

Kick-off questions

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Toolkit – Section 1 - Kick-off questions

Health Needs and Priorities

Do you think that the most urgent public health issues and priorities in your country could be addressed using AI?

- (1) Not sure, and no discussions are currently taking place.
- (2) No, but there are plans for discussions.
- (3) Neutral: There is some awareness, but no concrete actions or plans.
- (4) Yes, but a strategy has not yet been defined.
- (5) Yes, but there are no funds or expertise available in the country.

Strategic Alignment

Does this proposed AI project align with your country's or department's current strategic objectives or work plan?

- (1) No alignment with strategic objectives.
- (2) Poor alignment; requires significant changes.
- (3) Some alignment, but there are significant shortcomings.
- (4) Generally supports strategic objectives, with minor shortcomings.
- (5) Perfect alignment with strategic objectives.

Digital Health Landscape

Do you believe the country has effective digital tools, systems, and technological infrastructure to implement a National AI Strategy in the health sector?

- (1) No equipment at all.
- (2) Some equipment, but significant shortcomings remain.
- (3) Neutral: equipped, but with both strengths and weaknesses.
- (4) Generally equipped, but some improvements are needed.
- (5) Well-equipped with the necessary tools, systems, and infrastructure.

Data Availability and Quality

How would you rate the availability and quality of health data for AI implementation in terms of accuracy, completeness, and timeliness?

- (1) Data availability is very limited, and the data is of low quality.
- (2) Some data is available, but accuracy, completeness, and timeliness are inconsistent.
- (3) Neutral: Data availability and quality are average, with notable strengths and weaknesses.
- (4) Overall, good data availability with acceptable quality, but improvements are needed.
- (5) Data is widely available with high accuracy, completeness, and timeliness.

Data Suitable for Automation

Is the data suitable for automation using workflows and AI agents (e.g., regularly updated, structured, and consistent)?

- (1) The data is unstructured, not updated, and inconsistent.
- (2) The data is poorly structured and updated inconsistently.
- (3) The data is somewhat structured and up-to-date.
- (4) The data is mostly structured, updated regularly, and consistent.
- (5) The data is well-structured, updated regularly, and consistent.

Health Workforce Readiness

How prepared is your country's healthcare workforce to integrate and use AI technologies in the healthcare sector?

- (1) Not prepared.
- (2) Some preparation, but significant training and development are needed.
- (3) Neutral: Adequately prepared in some areas, but lacking in others.
- (4) Generally prepared, but some gaps in skills and experience remain.
- (5) Fully prepared with the necessary skills and experience to integrate and use AI technologies.

Collaboration on AI Development

Do you have your own team, a local partner, a university, or a private-sector collaborator involved in developing AI for healthcare?

- (1) No team or collaborators are involved in AI development.
- (2) Very limited collaboration, with no formal partnerships.
- (3) Some collaboration with a local partner or team, but limited involvement.
- (4) Significant collaboration with local partners, universities, or the private sector.
- (5) Fully integrated team with strong cross-sector partnerships.

Regulatory Adaptation and Innovation

Can regulatory agencies in your country quickly adapt regulations to keep pace with the rapid changes in AI technology in the healthcare sector?

- (1) No, they cannot adapt quickly.
- (2) Yes, but with significant delays and challenges.
- (3) Neutral: They are somewhat adaptable, but have both strengths and weaknesses.
- (4) Yes, generally speaking, but with some shortcomings in agility and innovation.
- (5) Yes, they are highly responsive and innovative in adapting regulations.

Ethical Considerations

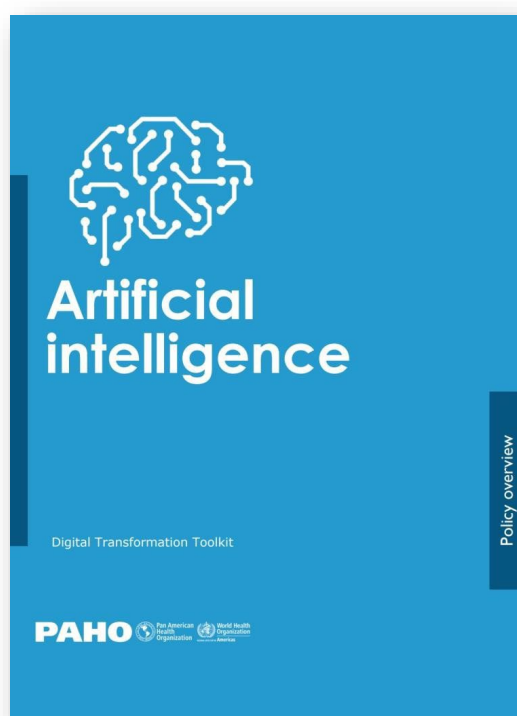
Are there any public documents, white papers, or guidelines that address the ethical aspects of AI specifically in the healthcare sector?

- (1) No documents, white papers, or guidelines are available.
- (2) There are some documents, white papers, and guidelines, but they are incomplete.
- (3) Neutral: There are documents, white papers, or guidelines, but they are average, with notable strengths and weaknesses.
- (4) Good coverage in existing documents and/or white papers and/or guidelines, but with shortcomings.
- (5) Comprehensive documents, white papers, and guidelines are available.

Education and Training Initiatives

How effective are current education and training initiatives in your country at raising awareness and promoting knowledge about AI in the healthcare sector among the general public and healthcare professionals?

- (1) There are no initiatives.
- (2) There are some initiatives, but they are limited and not very effective.
- (3) Neutral: Initiatives exist, but they are average, with notable strengths and weaknesses.
- (4) Overall, there are effective initiatives, but there is room for improvement.
- (5) Comprehensive and highly effective education and training initiatives have been implemented.



Document available at: <https://iris.paho.org/handle/10665.2/57947>



Section 2

Expanded assessment

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Toolkit – Section 2 - Expanded assessment

Governance and Leadership

National AI Strategy for Healthcare

Does your country have a national strategy or public policy on AI specifically for the healthcare sector?

- (1) No, and there are no plans to develop one.
- (2) No, but its development is being planned.
- (3) The strategy is currently being developed but has not yet been implemented.
- (4) There is a national AI strategy, with partial implementation in some areas of the sector.
- (5) There is a national AI strategy that has been established and implemented across the entire healthcare sector and its partners.

Leadership Commitment

How committed are national health leaders to AI initiatives in the health sector?

- (1) No commitment or interest has been demonstrated.
- (2) Leaders show interest, but there are no concrete actions.
- (3) Some commitment has been demonstrated, but its scope is inconsistent or limited.
- (4) Commitment demonstrated through some actions and initiatives.
- (5) Strong commitment to ongoing, substantial, and scalable initiatives at the national level.

Regulatory Framework

Does the current regulatory framework facilitate the implementation and use of AI in the healthcare sector?

- (1) There are no specific regulations regarding the use and implementation of AI, and the current regulatory framework does not facilitate it.
- (2) There are no specific regulations regarding the use and implementation of AI, but the current regulatory framework facilitates its implementation and use in some areas.
- (3) Some specific regulations on AI in healthcare are currently being developed, but they have not yet been approved or enacted.
- (4) There are specific regulations regarding the implementation of AI in healthcare, but they are not comprehensive.
- (5) The regulatory framework for artificial intelligence is comprehensive enough to facilitate its implementation and use at the national level.

Ethical Guidelines

Are there guidelines or frameworks to ensure transparency, explainability, and accountability of AI in the healthcare sector?

- (1) There are no ethical guidelines, or the existing ones do not address the use of information technologies or data processing in healthcare.
- (2) The guidelines cover only the traditional ethical principles of data governance (privacy, confidentiality, anonymization, and informed consent), but do not address algorithmic challenges.
- (3) The guidelines incorporate fundamental AI principles such as transparency (disclosing that a model is being used) and explainability (the ability to understand the parameters by which the algorithm makes decisions).
- (4) The current ethical framework incorporates the perspective of equity, including specific guidelines for assessing and mitigating biases in datasets and models.
- (5) A comprehensive ethical framework that encompasses all of the above principles and incorporates algorithmic accountability, explicitly requiring human-in-the-loop oversight mechanisms and ongoing audits of implemented models.

Infrastructure and Technology

Data Storage Infrastructure

What is the level of maturity and centralization of the infrastructure for healthcare data storage?

- (1) Local and fragmented silos. Data is stored on isolated physical servers within each facility.
- (2) Structured repositories, but decentralized or specific to individual programs.
- (3) Partial centralization. Data consolidation at the subnational level or integration of administrative databases.
- (4) Centralized storage at the national level with high availability, redundancy, and basic cybersecurity protocols.
- (5) Advanced and scalable infrastructure (e.g., data lakes in secure environments). Capacity for massive and continuous ingestion of structured and unstructured data, ready for AI.

Data Processing Capacity

What technical capacity does the system have to process and analyze the volumes of data generated?

- (1) No capacity or capacity dependent on the manual export of flat tables for review.
- (2) Basic analytical processing (generation of static reports and sporadic descriptive analyses).
- (3) Implementation of Business Intelligence (BI) platforms and dashboards updated periodically.
- (4) Advanced analytical processing capability, enabling data mining and population-based predictive models.
- (5) High-performance computing capability. Infrastructure capable of training, validating, and executing complex algorithmic models in real time.

Standards for Data Exchange

What is the level of adoption of standards for information exchange between different systems and levels of care?

- (1) Manual exchange or transmission of electronic files without any standardized format.
- (2) Point-to-point electronic exchange using proprietary solutions or custom-built interfaces (without common standards).
- (3) Emerging adoption of standards. Asynchronous exchanges of some basic datasets are achieved.
- (4) Formal interoperability architecture. Active use of robust syntactic and semantic standards (e.g., HL7 FHIR, SNOMED CT, ICD-11).
- (5) National integration bus operating in real time with full governance.

Connectivity

What is the level of broadband and internet connectivity in healthcare facilities?

- (1) Very limited connectivity.
- (2) Moderate connectivity in some areas.
- (3) Connectivity is inconsistent, with notable gaps.
- (4) Good connectivity in most areas.
- (5) Excellent connectivity nationwide.

Computing Resources

How accessible are high-performance computing resources for AI in healthcare sector?

- (1) Not accessible.
- (2) Limited access.
- (3) Access is inconsistent, with notable strengths and weaknesses.
- (3) Generally accessible.
- (4) Widely accessible and well-supported.

Infrastructure Readiness

Does your current infrastructure reliably support AI automation tools, APIs, and data agents?

- (1) The technology environment is closed or legacy; the infrastructure does not support these tools, and it is impossible to integrate APIs or algorithmic automation workflows.
- (2) Isolated AI tools (e.g., external web interfaces) are used, but the infrastructure does not provide direct connectivity. Data is moved manually without API integration.
- (3) The infrastructure allows for the use of standardized APIs for specific tasks, but lacks an environment to reliably support autonomous data agents.

- (4) Automated data pipelines (early Machine Learning Operations, or MLOps, practices) and secure testing environments are in place to support the deployment of AI agents and in-house models.
- (5) Elastic infrastructure (cloud or hybrid) that fully and reliably supports continuous automation, algorithmic monitoring, and the secure deployment of data agents integrated into health workflows.

Team and Expertise

Skills and Training

What is the availability of professionals trained in AI and data science for the healthcare sector?

- (1) The supply of professionals in AI and data science applied to healthcare is virtually nonexistent. The healthcare system is entirely dependent on external technology providers or international technical assistance for any data analytics initiative.
- (2) There are limited professionals and technical capabilities in the country, but they are concentrated in the private sector, the technology industry, or academia in general.
- (3) The availability of specialists is concentrated at the central level (ministries, regulatory agencies, or large referral hospitals).
- (4) The country has an adequate number of specialists distributed across different regions and levels of care.
- (5) The country has a critical mass of highly qualified and sustainable talent.

Capacity Building

Are there continuing professional development programs in AI for the health sector?

- (1) There are no continuing education programs in digital health or AI. Technology training depends on the individual or financial efforts of the professional, without institutional support.
- (2) National academic institutions are beginning to offer programs in data science, but specific offerings in digital health remain scarce and do not reach all regions.
- (3) Digital literacy initiatives have been implemented, and there are training initiatives, but they are neither widely accessible nor comprehensive at the national level.
- (4) There are adequate, standardized programs available for the workforce.
- (5) There are active talent retention policies in the public sector. A culture of practical and continuous learning serves, in practice, as the driving force behind active talent retention policies in the public sector.

Collaborations

Are there partnerships with academic and research institutions for the development of AI in the health sector?

- (1) There are no formal or informal partnerships. Efforts by the healthcare sector and academic institutions in the areas of data and AI operate in completely disconnected silos.
- (2) There are limited, informal partnerships. Collaborations depend on personal contacts or individual researchers for very specific pilot projects, without formal institutional support or funding.
- (3) Partnerships exist, but their scope is inconsistent or strictly limited to academic research. Institutional agreements have been signed for specific studies, but these agreements have not yet translated into training programs for healthcare system staff.
- (4) There are national digital literacy programs and formalized partnerships between the Ministry of Health and universities for the continuing education of the healthcare workforce.
- (5) Strong and active partnerships with academic institutions offering specialized graduate programs in AI in healthcare, and national communities of practice that generate ongoing local innovation.

Data Management and Quality

Data Availability

How readily available is health data for AI applications in your country?

- (1) Not available.
- (2) Limited availability.
- (3) Availability is inconsistent, with both strengths and weaknesses.
- (4) Generally available.
- (5) Widely available.

Data Quality: Accuracy (Precision and Validation)

What mechanisms are in place to ensure that the health data entered is correct, standardized, and free of errors or duplicates?

- (1) No measures are in place. Data entry is unrestricted (plain text) with no validation rules, resulting in a high rate of errors and duplicates.
- (2) There are periodic manual reviews or ad hoc audits to clean specific databases, but the process is reactive and requires significant human effort.
- (3) Information systems have basic validation rules at the time of entry (e.g., required numeric fields, drop-down menus), reducing typing errors.
- (4) Standardized data catalogs (e.g., national data dictionaries) are applied using automated tools that detect logical inconsistencies and centrally reconcile duplicate records.
- (5) Highly accurate data ecosystem with automated real-time validation, using algorithms for data cleansing, continuous enrichment, and identity resolution (e.g., a perfect Master Patient Index).

Data Quality: Integrity (Completeness)

To what extent do health records comprehensively capture all essential fields required for AI analysis and training, without fragmentation or omissions?

- (1) Records are chronically incomplete; key demographic or clinical variables are missing, making algorithmic analysis impossible.
- (2) A minimum set of health data has been defined by regulation, but compliance in practice is low, and there are no technical penalties for leaving fields blank.
- (3) Mechanisms exist that require mandatory fields to be filled out to close care episodes, resulting in operational databases, albeit with some historical gaps.
- (4) The data are highly complete, covering not only the clinical event but also integrating social determinants, medical history, and laboratory results into a unified and consistent record.
- (5) Automated systems continuously monitor the completeness of the databases, flagging patterns of omission and ensuring that the datasets are 100% complete and ready to feed into predictive models.

Data Quality: Timeliness (Latency / Timeliness)

What is the latency between the time clinical or epidemiological data is generated and its availability in the central system for decision-making?

- (1) Data is subject to delays of months or years before being consolidated, rendering it useless for crisis management or current predictive models.
- (2) Data is consolidated through monthly or quarterly batch transfers, depending on manual export and import processes.
- (3) There are automated data flows that update central repositories on a weekly or daily basis, allowing for close—but not immediate—epidemiological monitoring.
- (4) Critical systems (epidemiological surveillance, emergency departments, hospital beds) transmit data continuously (with a latency of hours), enabling highly dynamic dashboards.
- (5) The technological architecture enables the continuous, real-time flow and ingestion of data, allowing AI algorithms to issue early alerts and provide clinical decision support the moment an event occurs.

Data Protection

A regulatory framework for data protection that allows for the secondary use of information to train algorithms.

- (1) There is no regulatory framework.
- (2) There is basic regulation focused solely on the confidentiality of the doctor-patient relationship and billing, but without clear guidelines on digital data.
- (3) There is a robust regulatory framework for traditional information systems (electronic health records, telemedicine), but it does not explicitly legislate the secondary use of data for data mining or training AI models.

- (4) The regulatory framework explicitly authorizes and sets conditions for the secondary use of health data for algorithmic research, establishing consent protocols or exemptions for public health purposes.
- (5) A comprehensive framework that, in addition to secondary use, regulates patients' rights regarding automated decisions and includes audits of the data used to train AI.

Handling of Sensitive Data

Policies for handling sensitive health data in Big Data architectures and AI ecosystems.

- (1) There are no differentiated policies; all data is treated with the same (or no) level of security.
- (2) There are initial discussions or policies on paper, but they are limited to restricting physical access or access to records via simple passwords.
- (3) There are formal role-based access control (RBAC) policies for clinical systems (e.g., only the psychiatrist views mental health notes), but the data is exported in raw form for statistical analysis.
- (4) There are specific protocols to isolate sensitive variables (such as ethnicity or social determinants) in the data pipelines that feed the models, preventing discriminatory correlations.
- (5) Comprehensive policies that implement AI-driven Data Loss Prevention (DLP) tools, detecting and blocking in real time any unauthorized exposure of sensitive variables in development environments.

Regulation of Data Anonymization

Do existing regulatory frameworks include measures for standardized anonymization to address the risks of re-identification by artificial intelligence?

- (1) There are no regulatory measures in place regarding the obligation to anonymize data.
- (2) The regulations generically mention the obligation to "protect identity," but do not technically define what constitutes anonymized data.
- (3) The regulations require the removal of direct identifiers (names, identification documents), but do not require protection against AI-based data triangulation attacks.
- (4) The regulations establish specific technical standards for de-identification as a mandatory legal requirement before releasing data for AI training.
- (5) The regulation incorporates and promotes the generation and legal validation of synthetic data (artificial data that retains statistical value without posing a privacy risk) as the gold standard for algorithmic development.

Measures and Procedures for Data Anonymization

Do existing procedures include measures for the anonymization and de-identification of health data?

- (1) No measures are in place; data is shared or analyzed with full identifiers.
- (2) Initial measures are applied, consisting of manually removing columns in spreadsheets (names, ID numbers) before sharing a file.

- (3) Automated routines exist in the databases to mask or pseudonymize direct identifiers when exporting reports, although these can be reversed by the central administrator.
- (4) Implementation of privacy-enhancing technologies (PETs) in the data flow. Datasets undergo perturbation or differential privacy algorithms before reaching data scientists.
- (5) Fully automated data pipelines that generate high-fidelity synthetic replicas, enabling secure, large-scale database sharing for collaborative innovation (such as public health Datatons) with zero risk of re-identification.

Funding and Sustainability

Availability of Funding

Are there sources and availability of funding for AI projects in the healthcare sector?

- (1) There are no allocated or available funding sources for advanced technology or AI projects.
- (2) Funding depends exclusively on external sources, grants, international cooperation, or one-time funds for specific events (e.g., datathons or isolated pilot projects).
- (3) Institutional budgets exist, but they are strictly allocated on a project-by-project basis as capital expenditures (CAPEX). There is no guaranteed, ongoing fund for algorithmic digital transformation.
- (4) There is a formal, recurring budget line item specifically earmarked for digital health and AI initiatives.
- (5) A robust funding ecosystem that combines structural public funding with advanced models, such as public-private partnerships (PPPs) and shared innovation funds, ensuring flexibility and scalability at the national level.

Financial Sustainability

Are there plans for the long-term financial sustainability of AI initiatives in the healthcare sector?

- (1) No plans have been established. Funding covers only the initial acquisition or development of the algorithm, without considering its lifecycle.
- (2) The plans ensure only basic technical support (traditional software licenses or physical servers) in the short term.
- (3) The projects require a Total Cost of Ownership (TCO) calculation that includes cloud usage and APIs for the first few years, but they lack a permanent funding source to cover these costs in the long term.
- (4) The unique recurring costs of AI (computing power, retraining of algorithmic models, continuous validation) are formally integrated into the operating expenses budget.
- (5) Comprehensive financial plans based on return on investment and cost-recovery mechanisms. Sustainability is ensured by the savings that the AI model itself generates within the healthcare system (e.g., optimization of administrative workflows or telemedicine).

Cost-Benefit Analysis

Have the economic impact and benefits of AI projects been evaluated?

- (1) No evaluation has been conducted.
- (2) Evaluations are limited to comparing initial acquisition costs among different technology providers, without measuring the actual impact on the system.
- (3) Basic return on investment (ROI) analyses are conducted after implementation, focusing primarily on administrative indicators.
- (4) AI undergoes formal HTA methodologies prior to scaling up, evaluating clinical cost-effectiveness (e.g., cost per early diagnosis, reduction in hospital readmissions).
- (5) Continuous, real-time evaluations. The infrastructure allows for monitoring how the economic impact of AI evolves as the algorithm interacts with the population, automatically adjusting the investment roadmap.

Public and Stakeholder Engagement

Public awareness and understanding of AI in healthcare

How would you rate the general public's awareness and understanding of AI technologies and their potential applications in the healthcare sector?

- (1) Very little awareness and acceptance: The Ministry of Health lacks a communication strategy; the public is unaware that algorithms or databases are being used at the national level.
- (2) Moderate awareness and acceptance: The Ministry publishes regulations in a one-way, technical manner, without outreach campaigns accessible to the public.
- (3) Awareness and acceptance exist, but are inconsistent: The health authority measures public perceptions and fears (e.g., through population surveys), but lacks a structured response plan at the national level.
- (4) Good awareness and acceptance: National digital rights literacy programs are implemented, explaining the impact of AI on public health.
- (5) There are government transparency dashboards where citizens can audit the performance and use of the algorithms implemented in the healthcare system.

Stakeholder Involvement

How involved are key stakeholders (patients, healthcare professionals, policymakers) in AI initiatives?

- (1) Technological decisions are made centrally without consulting provider networks, academia, or civil society organizations.
- (2) Stakeholders (e.g., medical associations or provincial administrators) are informed only when the tools are about to be implemented, with no opportunity to influence their design.
- (3) The Ministry convenes public consultations or ad hoc working groups for specific projects, but there is no structural and permanent integration of these stakeholders.

- (4) A national governance body (e.g., a digital health committee) has been established with permanent representation from clinicians, universities, patients, and policymakers.
- (5) The country leads a co-creation ecosystem, fostering participatory innovation across the country so that algorithms respond to real, consensus-based needs.

Feedback Mechanisms

Are there systems in place to collect and address stakeholder feedback on AI initiatives?

- (1) No systems are in place. At the national level, there are no channels for receiving reports on incidents, biases, or improvements to AI tools.
- (2) Generic support channels (e.g., the ministry's traditional IT help desk) are used, without the capacity to categorize specific algorithmic failures.
- (3) There are specific channels for reporting AI failures, but the ministry's analysis is reactive and rarely leads to model retraining or agile regulatory changes.
- (4) There is a national AI technovigilance program that systematically consolidates, analyzes, and responds to feedback from hospitals and users.
- (5) Continuous monitoring and adjustment at the national level; feedback fuels a closed-loop system where the health authority audits and demands real-time improvements from algorithmic providers.

Implementation and Integration

Pilot Projects

Are there any AI pilot projects in the healthcare sector, and what are their results?

- (1) There are no pilot projects.
- (2) There are ad hoc pilot projects initiated by individual providers or institutions, without formal evaluation methodologies or defined public health objectives.
- (3) There are ongoing pilot projects, but it is difficult to assess their actual impact because they lack standardized metrics established prior to implementation.
- (4) Pilot projects are conducted using formal methodologies (e.g., aligned with SMART criteria), generating documented evidence regarding their effectiveness, biases, and clinical impact.
- (5) Validated innovation ecosystem. Successful pilot projects have clear institutional mechanisms in place to transition into permanent programs within the health system.

Scalability

What is the level of technical and regulatory readiness to scale successful AI projects nationwide?

- (1) Lack of scalability. The infrastructure is closed or on-premises, preventing technological expansion.
- (2) Technical scaling is feasible in isolation but is blocked by the lack of a regulatory, ethical, or national interoperability framework.

- (3) Integration potential is moderate, but scaling requires redesigning legacy architectures and reaching data governance agreements across different jurisdictions.
- (4) The infrastructure (cloud, standardized databases) and national governance are ready to adopt and scale proven tools in a structured manner.
- (5) The use of semantic and syntactic interoperability standards allows an algorithm that is successful in one hospital to be immediately deployed across the entire national public healthcare network.

Integration with Health Care Systems

What is the current level of adoption and integration of artificial intelligence solutions in the following areas of the health care system?

- (1) There are no initiatives, projects, or discussions to implement artificial intelligence in this specific area.
- (2) There are discussions, academic research, or isolated proof-of-concept studies, but there are no algorithms operating in real-world scenarios with healthcare system data.
- (3) Practical pilot projects are underway, or AI tools are being used in isolation at some healthcare facilities (e.g., triage software in a hospital), but without a connection to national information systems.
- (4) AI solutions in this area have already moved beyond the pilot phase and are formally integrated into central information systems (e.g., predictive algorithms directly connected to the Electronic Health Record or the surveillance system).
- (5) The use of AI in this area is a mandatory national standard. It operates across the board, processing real-time data to support ministerial decision-making.

Emergency Response

- (1) None.
- (2) There are isolated discussions.
- (3) There are practical pilot projects.
- (4) Integrated into information systems.
- (5) AI is a national standard.

Epidemiological Surveillance

- (1) Does not exist.
- (2) There are isolated discussions.
- (3) Practical pilot projects exist.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Immunization

- (1) Does not exist.

- (2) There are isolated discussions.
- (3) There are pilot programs.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Mental Health

- (1) Does not exist.
- (2) There are isolated discussions.
- (3) There are pilot programs.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Chronic Noncommunicable Diseases

- (1) Does not exist.
- (2) There are isolated discussions.
- (3) There are practical pilot programs.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Health Education and Promotion

- (1) Does not exist.
- (2) There are isolated discussions.
- (3) There are pilot programs.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Communicable diseases

- (1) Does not exist.
- (2) There are isolated discussions.
- (3) There are pilot projects.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Health Policy and Decision-Making

- (1) Does not exist.
- (2) There are isolated discussions.
- (3) There are practical pilot projects.
- (4) Integrated into the information system.
- (5) AI is a national standard.

Monitoring and Evaluation

Performance Metrics

Are there established metrics for monitoring the performance of AI projects?

- (1) There are no established metrics. Implementation is evaluated solely on an anecdotal basis or based on user perception.
- (2) Limited established metrics. Purely technical indicators (e.g., server uptime, number of accesses) are measured, but clinical accuracy and algorithmic biases are not monitored.
- (3) Algorithmic performance metrics exist (e.g., false positive/negative rates), but they are measured manually, retrospectively, or sporadically.
- (4) Metrics are structured according to specific, measurable, achievable, relevant, and time-bound criteria (SMART methodology), enabling periodic and systematic audits of clinical and technical performance across the entire network.
- (5) The Ministry of Health uses dashboards that automatically alert to algorithmic drift if the model loses accuracy in the face of new epidemiological data.

Evaluation Frameworks

Are there frameworks for evaluating the impact and effectiveness of AI solutions in healthcare?

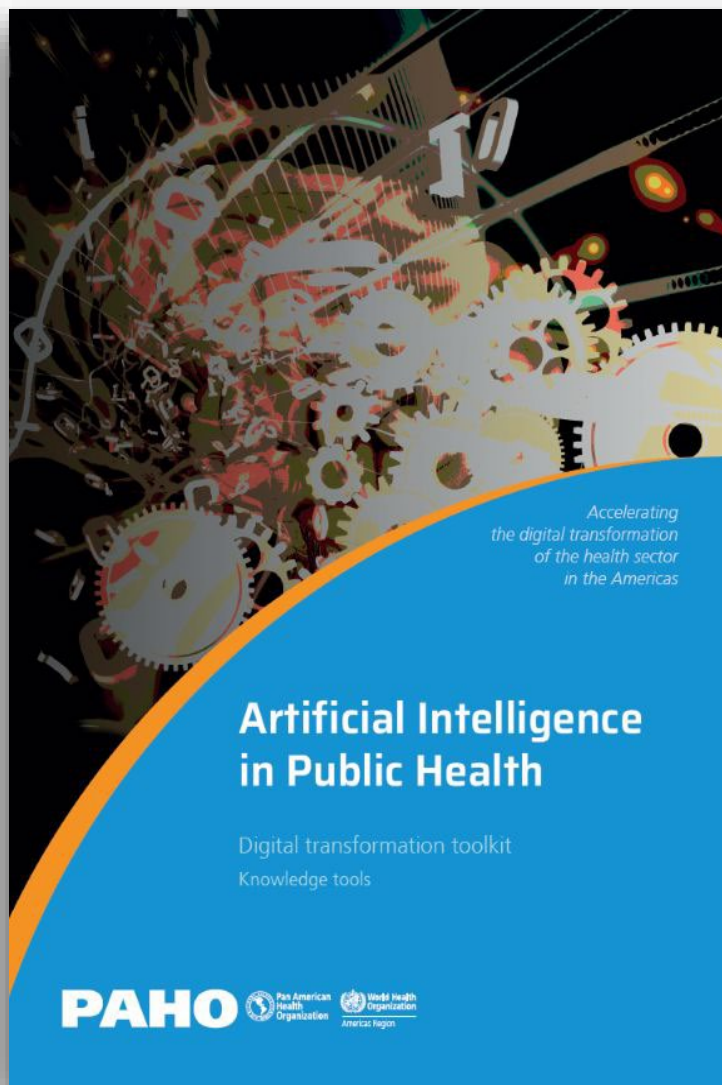
- (1) There are no established frameworks.
- (2) Informal or ad-hoc evaluations are driven exclusively by technology providers, without a methodology of their own or one standardized by the health authority.
- (3) Evaluation frameworks exist, but they focus almost exclusively on financial, logistical, or administrative efficiency impacts, without in-depth clinical or epidemiological rigor.
- (4) Formal Health Technology Assessment (HTA) methodologies are applied to AI, measuring actual clinical impact, population equity, patient safety, and cost-effectiveness.
- (5) Dynamic and transparent evaluation frameworks. The results regarding public health impact are continuously updated and are binding, determining through regulatory channels whether an AI tool should be scaled up, adjusted, or withdrawn at the national level.

Continuous Improvement

Are there mechanisms for continuous improvement based on the results of the AI evaluation?

- (1) No mechanisms are in place. AI tools are static (unchangeable “black boxes”) and are not adjusted after their initial deployment.
- (2) Reactive mechanisms: AI improvement or correction occurs only if a serious incident is reported or through software patches sent by the provider, without prior planning.

- (3) Review cycles exist, but updating the algorithmic model is slow, bureaucratic, and requires the signing of new contracts or addenda to integrate improvements.
- (4) There are clear protocols and operating budgets specifically allocated for the periodic retraining of models using recent local clinical data.
- (5) A continuous learning ecosystem where the infrastructure allows for secure and seamless adjustment of models in response to new variables, while always maintaining a mechanism for expert oversight by the health authority (human-in-the-loop) before implementing the improvement in production.



Document available at: <https://iris.paho.org/handle/10665.2/53732>

Analysis of the results

Analyzing the results of the AI for Public Health Readiness Assessment Tool is a crucial step in understanding countries preparedness to integrate AI into the public health sector. PAHO and IDB, in collaboration with key partners and stakeholders, will work closely with each member state on the analysis of the assessment data, ensuring a collaborative and tailored approach to interpreting the findings, identifying strengths and areas for improvement, and guiding strategic planning and decision-making. The analysis process will consider the following steps:

Step 1: Data Collection and Organization

PAHO and IDB, in collaboration with key partners and stakeholders, will assist in collecting all responses from the assessment tool, ensuring that the data is organized in a structured format, preferably a spreadsheet or database, where each question's responses are clearly recorded. This organized format will facilitate easier analysis and comparison.

Step 2: Quantitative Analysis

Scoring System: Each response in the tool is rated on a scale from 1 to 4. PAHO and IDB, in collaboration with key partners and stakeholders, will help calculate the average score for each category to get an overall picture of readiness in that area. For instance, if the category "Health Workforce Readiness" consists of multiple questions, PAHO and IDB, in collaboration with key partners and stakeholders, will assist in averaging the scores of these questions to determine the overall readiness in this category.

Distribution of Scores: PAHO and IDB, in collaboration with key partners and stakeholders, will help examine the distribution of scores to identify patterns and outliers. High scores indicate areas of strength, while low scores highlight areas needing attention. Visual aids such as bar charts or heat maps may be used to visualize the distribution of scores across different categories.

Step 3: Qualitative Analysis

Identify Common Themes: PAHO and IDB, in collaboration with key partners and stakeholders, will support the review of qualitative responses to identify common themes and insights. Recurring mentions of specific challenges or strengths, such as lack of funding, inadequate infrastructure, or strong regulatory frameworks, will be highlighted.

Contextual Factors: The analysis will consider contextual factors that might influence the scores. For example, a low score in "Digital Health Landscape" might be due to recent disruptions or ongoing infrastructure projects.

Step 4: Gap Analysis

Benchmarking: PAHO and IDB, in collaboration with key partners and stakeholders, will help compare your scores against benchmarks or standards set by other countries or international guidelines. This comparison will provide a clearer understanding of where your country stands in relation to others and identify specific areas that require improvement.

Priority Areas: Priority areas for action will be identified based on the gap analysis. Focus will be on categories with the lowest scores and those critical for the successful implementation of AI in public health, such as data quality and workforce readiness.

Step 5: Strategic Recommendations

Action Plans: PAHO and IDB, in collaboration with key partners and stakeholders, will assist in developing action plans to address identified gaps. Each plan will include specific, measurable, achievable, relevant, and time-bound (SMART) objectives. For example, if data quality is identified as a weakness, an action plan might include steps to standardize data collection processes and improve data governance.

Resource Allocation: PAHO and IDB, in collaboration with key partners and stakeholders, will guide efficient resource allocation to address the prioritized areas. Ensuring that funding, human resources, and technological investments are aligned with the strategic goals identified in the analysis.

Stakeholder Engagement: PAHO and IDB, in collaboration with key partners and stakeholders, will facilitate engagement with relevant stakeholders, including government agencies, healthcare providers, and technology partners, to support the implementation of the action plans. Collaborative efforts will be key to addressing complex challenges and achieving desired outcomes.

Step 6: Monitoring and Evaluation

Performance Metrics: PAHO and IDB, in collaboration with key partners and stakeholders, will help establish performance metrics to monitor the progress of action plans. These metrics will be aligned with the goals set out in the strategic recommendations.

Continuous Improvement: PAHO and IDB, in collaboration with key partners and stakeholders, will assist in implementing a continuous improvement process where feedback from monitoring and evaluation activities is used to refine and adjust action plans. This iterative process will ensure that the strategies remain effective and relevant.



Section 3

Critical thinking questions

Artificial Intelligence in Public health
Readiness assessment toolkit

Toolkit – Section 3 - Critical thinking questions

Vision for 2030

- When you think about the year 2030, what positive changes do you foresee in the healthcare sector as a result of AI adoption?
- How do you expect AI to improve patient outcomes and the delivery of healthcare services?
- What advances do you foresee in disease prevention and management?
- How could AI improve the efficiency and effectiveness of healthcare systems?
- What new capabilities or services do you expect AI to enable in public health?
- How do you foresee AI addressing current health disparities and promoting equity in access to and quality of medical care?

Patient Outcomes

- How do you expect AI to improve patient outcomes and the delivery of health care by 2030?
- What specific improvements do you foresee in diagnosis and treatment?
- How could AI contribute to personalized and precision medicine?

Patient Experience

- How do you foresee AI transforming the patient experience within the healthcare system?
- What improvements do you foresee in patient engagement and satisfaction?
- How could AI facilitate more personalized and proactive healthcare interactions?

Healthcare Efficiency

- How could AI improve the efficiency and effectiveness of healthcare systems by 2030?
- In what ways could AI optimize administrative processes and reduce healthcare costs?
- How do you think AI will improve resource allocation and management in healthcare facilities?
- What measures are being taken to assess and mitigate the environmental impact of AI projects in healthcare?

Public Health Capabilities

- What new capabilities or services do you expect AI to enable in public health?
- How could AI support large-scale health monitoring and epidemiological studies?
- What innovations do you foresee in telehealth and remote care?

Ethical Considerations

- What ethical concerns might arise from the implementation of AI in public health, and how can they be addressed to ensure patient safety and data privacy?
- How will we ensure the transparency and accountability of AI systems?
- What measures can be implemented to prevent bias in AI algorithms?
- How are informed consent and the duty to inform addressed in the integration of AI technologies into healthcare?

Equity and Accessibility

- How can we ensure that AI technologies benefit all segments of the population, including marginalized and rural communities?
- What strategies can be used to address the digital divide?
- How can we make AI tools accessible and easy to use for healthcare professionals at all levels?

Sustainability

- What long-term strategies should be implemented to maintain and update AI systems in healthcare?
- How can we ensure ongoing funding and resources for AI projects?
- What plans are needed to ensure ongoing training and capacity building for healthcare professionals?

Interoperability

- How can we ensure that AI systems integrate seamlessly with existing health information systems and electronic health records?
- What standards and protocols are necessary for data exchange and system interoperability?
- How can we manage the transition period when integrating new AI technologies with existing systems?

Data Governance

- How should we manage and govern health data to maximize the benefits of AI while protecting patient privacy?
- What policies should be established for data sharing and use?
- How can we ensure compliance with national and international data protection regulations?

Change Management

- How can we effectively manage the change process when introducing AI technologies into the healthcare system?
- What steps can we take to ensure acceptance and support from all stakeholders?
- How can we address potential resistance from healthcare professionals and patients?

Impact Assessment

- How can we measure the impact of AI implementation on health outcomes and system efficiency?
- What key performance indicators (KPIs) should we establish?
- How can we conduct periodic evaluations to assess the effectiveness of AI tools?

Public Trust

- How can we foster and maintain public trust in AI technologies used in healthcare?
- What communication strategies can we use to raise public awareness of the benefits and risks of AI?
- How can we involve patients and the public in the development and evaluation of AI solutions?

Preparing for the Future

- How can we design AI strategies that adapt to future technological advances and evolving healthcare needs?
- What flexible frameworks can we implement to accommodate new developments in AI?
- How can we anticipate and plan for emerging trends and challenges in AI technology?



Section 4

Strategic Thinking Questions for Multistakeholder Engagement in AI for Health

Artificial Intelligence in Public health
Readiness assessment toolkit

Toolkit – Section 4 - Strategic Thinking Questions for Multistakeholder Engagement in AI for Health

Financial Resources and Investment

- What specific funding mechanisms can the Ministry of Finance and international development banks provide to ensure long-term financial support for AI initiatives in healthcare?

Collaboration with: Ministry of Finance, International Development Banks

- How can private sector investors encouraged to contribute to AI-driven health projects, and what partnerships can be established to leverage their resources and expertise?

Collaboration with: Private Sector Investors, Venture Capital Firms, Healthcare Technology Companies

Educational Programs and Training

- What curricular changes are needed in medical and healthcare education to incorporate AI and data science, and how can universities and technical institutes collaborate to implement these changes?

Collaboration with: Ministry of Education, Universities, Technical Institutes

- How can NGOs specializing in education support the ongoing professional development in AI for current healthcare personnel, and which programs should be prioritized?

Collaboration with: Educational NGOs, Professional Health Associations, Continuing Education Providers

Digital Infrastructure

- What are the current gaps in digital infrastructure within the healthcare sector, and how can the Ministry of ICT and telecommunication companies address them to support the implementation of AI?

In collaboration with: Ministry of Information and Communication Technology (ICT), Telecommunication Companies

- How can international technology organizations contribute to the development of scalable and resilient digital health systems in our country?

In collaboration with: International Tech Organizations (e.g., IEEE, ITU)

Regulatory and Ethical Frameworks

- What specific regulatory challenges do we face in implementing AI in healthcare, and how can we collaborate with the Ministry of Justice and national ethics committees to overcome them?

Collaboration with: Ministry of Justice, National Ethics Committees, Legal Experts

- What best practices from international health organizations can be adapted to develop robust ethical guidelines for the use of AI in our healthcare system?

Collaboration with: World Health Organization (WHO), Pan American Health Organization (PAHO), IDB, and International Bioethics Organizations

Workforce Development

- What key skills and competencies do health professionals need to effectively use AI technologies? How can the Ministry of Labor facilitate training programs to develop these skills?

Collaboration with: Ministry of Labor, Professional Health Associations, Vocational Training Institutions

- How can professional healthcare associations contribute to the establishment of standards and the certification of AI-related competencies in health care?

In collaboration with: Medical Boards, Nursing Councils, AI Certification Bodies

Equitable Access and Inclusion

- What are the main barriers to equitable access to AI-based health services in rural and underserved areas? How can the Ministry of Social Welfare and community health organizations collaborate to address these barriers?

Collaboration with: Ministry of Social Welfare, Community Health Organizations, Rural Health NGOs

- How can NGOs focused on health equity collaborate to design and implement AI solutions that specifically address the needs of vulnerable populations?

Collaboration with: Health Equity NGOs, Public Health Institutes, Social Justice Organizations

Modernization of Health Centers

- What infrastructure improvements are essential for health centers to support AI technologies? How can the Ministry of Public Works and Infrastructure prioritize these improvements?
Collaboration with: Ministry of Public Works and Infrastructure, Health Center Administrators
- How can health center administrators participate in the planning and implementation of modernization projects to ensure that new technologies are effectively integrated into clinical workflows?
In collaboration with: Hospital Boards, Healthcare Management Associations, Infrastructure Development NGOs

Research and Innovation

- What are the most critical research gaps in AI applications for healthcare? How can academic institutions and research funding agencies be mobilized to address them?
Collaboration with: Ministry of Research and Innovation, Academic Institutions, Research Funding Agencies
- How can international research collaborations be leveraged to accelerate innovation and share best practices in AI for healthcare?
Collaboration with: International Research Collaborations, Global Health Research Networks, Bilateral Research Partnerships

Cybersecurity Measures

- What specific cybersecurity threats are most relevant to AI systems in healthcare sector, and how can the Ministry of the Interior and cybersecurity companies develop specific strategies to mitigate them?
Collaboration with: Ministry of the Interior, Cybersecurity Companies, National Cybersecurity Agencies
- How can the IT departments of healthcare institutions be trained and equipped to implement and maintain robust cybersecurity protocols?
Collaboration with: Healthcare IT Departments, Cybersecurity Training Institutes, Professional IT Associations

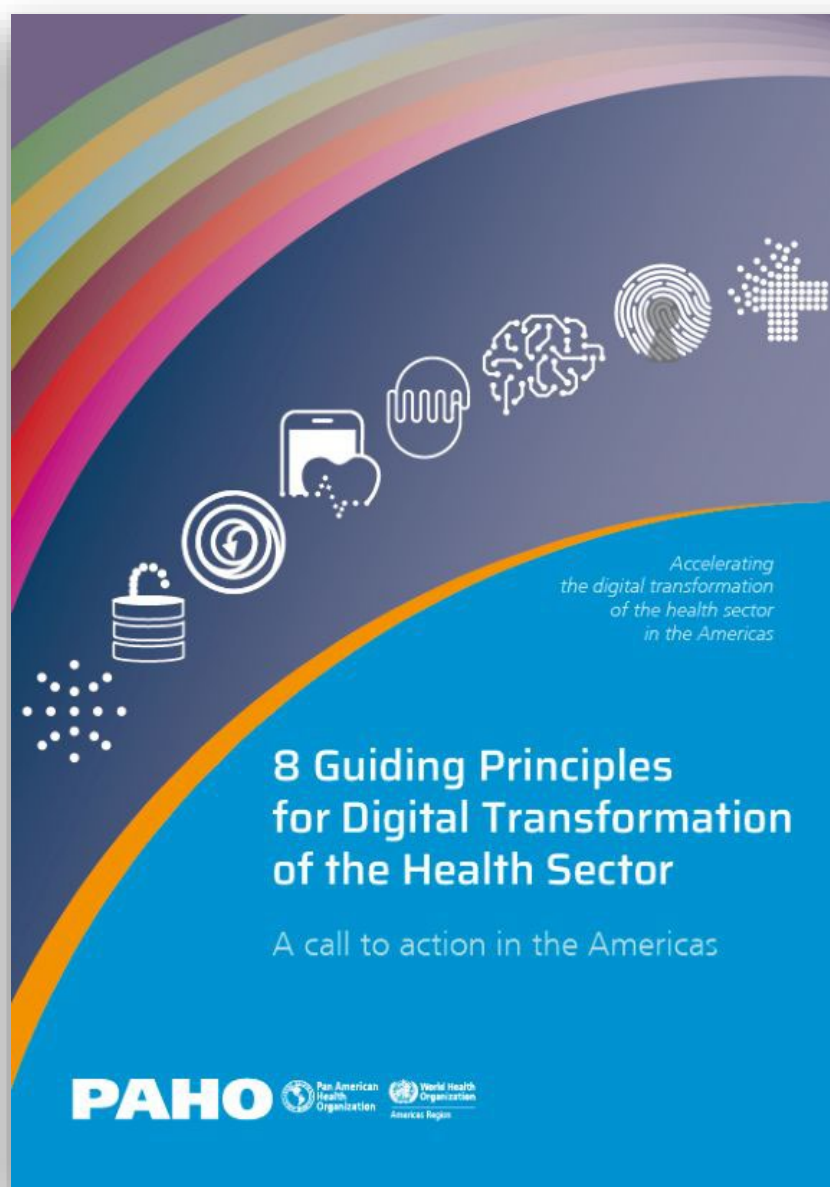
International Collaboration and Partnerships

- What opportunities exist for bilateral and multilateral health initiatives to support the development of AI in our country, and how can the Ministry of Foreign Affairs facilitate these partnerships?

Collaboration with: Ministry of Foreign Affairs, Bilateral Health Agreements, Multilateral Health Organizations

- How can we collaborate with global AI consortia and international health organizations to share knowledge, resources, and technologies that advance AI in healthcare?

Collaboration with: Global AI Consortia, World Health Organization and International Development Partners



Document available at: <https://iris.paho.org/handle/10665.2/54256>



Section 5

Critical Considerations for a Successful AI Implementation in the Health Sector

Artificial Intelligence in Public health
Readiness assessment toolkit

Toolkit – Section 5 - Critical Considerations for a Successful AI Implementation in the Health Sector

Health Care Needs and Priorities

- **Identifying Key Health Challenges:** Understanding the most pressing public health issues and priorities is crucial. AI should be leveraged to address these challenges effectively, ensuring that the technology is aligned with national health goals and priorities.
- **Facilitating Strategic Discussions:** Engage stakeholders in meaningful discussions to explore the potential of AI in addressing health challenges. Strategic dialogues are essential for aligning AI initiatives with public health needs.
- Existing Health Care Infrastructure
- **Assessing Current Infrastructure:** A thorough evaluation of the existing health care infrastructure, including facilities, equipment, and human resources, is imperative. Identifying strengths and weaknesses will guide necessary upgrades and optimizations for AI integration.
- **Planning for Infrastructure Enhancements:** Investing in the enhancement of health care infrastructure is vital to support the successful deployment of AI technologies. This includes upgrading digital health systems, improving data storage, and ensuring robust connectivity.

Digital Health Landscape

- **Evaluating Digital Readiness:** Assess the readiness of digital health tools, systems, and technological infrastructure. A well-equipped digital health landscape is foundational for implementing a National AI Strategy in the health sector.
- **Closing Technological Gaps:** Identify and address significant gaps in digital health infrastructure. Ensuring that the necessary tools, systems, and technologies are in place is essential for seamless AI integration.
- Data Availability and Quality
- **Ensuring Data Accuracy and Completeness:** High-quality health data is the backbone of effective AI implementation. Ensuring the accuracy, completeness, and timeliness of health data is crucial for AI applications to deliver meaningful insights and outcomes.
- **Improving Data Management Practices:** Implement robust data management practices to enhance data quality. This includes standardizing data collection processes, ensuring secure data storage, and promoting data interoperability.

Health Workforce Readiness

- **Building AI Competencies:** Invest in training and development programs to build AI competencies among health professionals. A well-prepared health workforce is essential for the successful integration and utilization of AI technologies.
- **Addressing Skills Gaps:** Identify and address gaps in skills and expertise within the health workforce. Continuous professional development is necessary to keep pace with advancements in AI and ensure effective implementation.

Existing Regulatory Frameworks

- **Establishing Robust Regulations:** Develop and enforce comprehensive regulatory frameworks to govern the use of AI in healthcare. Effective regulations are crucial for ensuring the safe and ethical deployment of AI technologies.
- **Adapting to Technological Changes:** Regulatory bodies must be agile and responsive to the fast pace of AI technology changes. Establish mechanisms to quickly adapt regulations, addressing new challenges and opportunities as they arise.

Ethical Considerations

- **Upholding Ethical Standards:** Develop and implement ethical guidelines to govern AI applications in healthcare. Address concerns such as bias, transparency, accountability, and data privacy to ensure ethical use of AI.
- **Promoting Public Trust:** Foster public awareness and understanding of the ethical implications of AI in healthcare. Engaging with the public and ensuring transparency in AI initiatives is key to building trust and acceptance.

Stakeholder Engagement

- **Fostering Inclusive Participation:** Engage a wide range of stakeholders, including healthcare professionals, patients, policymakers, and AI developers, in the planning and implementation process. Inclusive participation ensures diverse perspectives and enhances the relevance of AI initiatives.
- **Establishing Feedback Mechanisms:** Implement systems for collecting and addressing feedback from stakeholders. Continuous stakeholder engagement and feedback are essential for refining and improving AI projects.

Public Awareness and Education

- **Raising Public Awareness:** Increase public awareness and understanding of AI technologies and their potential benefits in healthcare. Public education initiatives are critical for fostering acceptance and support for AI integration.
- **Enhancing Education and Training Programs:** Develop comprehensive education and training programs to build AI knowledge and skills among the general public and

healthcare professionals. Effective training initiatives are foundational for successful AI implementation.

Funding and Resources

- **Securing Adequate Funding:** Identify and secure funding sources for AI projects. Sustainable financial support from government budgets, international aid, and private sector investments is crucial for the long-term success of AI initiatives.
- **Optimizing Resource Allocation:** Ensure efficient allocation of financial, human, and technological resources for AI projects. Strategic resource management is essential for maximizing the impact and sustainability of AI initiatives.



Section 6

Guiding principles

Artificial Intelligence in Public health
Readiness assessment toolkit

Toolkit – Section 6 – Guiding Principles

PAHO's guiding principles for the use of artificial intelligence for public health (AI4PH) interventions

The use of AI in public health must be guided by superior technical and ethical considerations aimed to mitigate ethical risk in public health and related policy interventions, reflected in the following eight guiding principles:

- People-centered. Actions and solutions must be people-centered and not be used solely by itself. As one of many technologies to aid public health, AI should respect the rights of the individual.
- Ethically grounded. Discussions, developments, and implementation must be grounded in the globally recognized ethical principles of human dignity, beneficence, nonmaleficence, and justice.
- Transparent. Transparent approaches must always be used and communicated when developing AI algorithms.
- Data-protected. Privacy, confidentiality, and security of data use must be foundational to every AI development.
- Demonstrates scientific integrity. AI interventions should follow scientific best practice, including being reliable, reproducible, fair, honest, and accountable.
- Open and shareable. Everything must be as open and shareable as possible. Tools and underlying concepts of openness must be a feature and a critical success factor of any AI development.
- Nondiscriminatory. Fairness, equality, and inclusiveness in impact and design should always form the foundation of any AI for public health initiative.
- Human-controlled technology. Formal processes for human control and review of automated decisions are mandatory

WHO six principles to ensure AI works for the public interest in all Countries

To limit the risks and maximize the opportunities intrinsic to the use of AI for health, WHO provides the following principles as the basis for AI regulation and governance:

- Protecting human autonomy. In the context of health care, this means that humans should remain in control of healthcare systems and medical decisions; privacy and confidentiality should be protected, and patients must give valid informed consent through appropriate legal frameworks for data protection.

- Promoting human well-being and safety and the public interest. The designers of AI technologies should satisfy regulatory requirements for safety, accuracy, and efficacy for well defined use cases or indications. Measures of quality control in practice and quality improvement in the use of AI must be available.
- Ensuring transparency, explainability, and intelligibility. Transparency requires that sufficient information be published or documented before the design or deployment of an AI technology. Such information must be easily accessible and facilitate meaningful public consultation and debate on how the technology is designed and how it should or should not be used.
- Fostering responsibility and accountability. Although AI technologies perform specific tasks, it is the responsibility of stakeholders to ensure that they are used under appropriate conditions and by appropriately trained people. Effective mechanisms should be available for questioning and for redress for individuals and groups that are adversely affected by decisions based on algorithms.
- Ensuring inclusiveness and equity. Inclusiveness requires that AI for health be designed to encourage the widest possible equitable use and access, irrespective of age, sex, gender, income, race, ethnicity, sexual orientation, ability, or other characteristics protected under human rights codes.
- Promoting AI that is responsive and sustainable. Designers, developers, and users should continuously and transparently assess AI applications during actual use to determine whether AI responds adequately and appropriately to expectations and requirements. AI systems should also be designed to minimize their environmental consequences and increase energy efficiency.

Governments and companies should address anticipated disruptions in the workplace, including training for healthcare workers to adapt to the use of AI systems, and potential job losses due to use of automated systems.



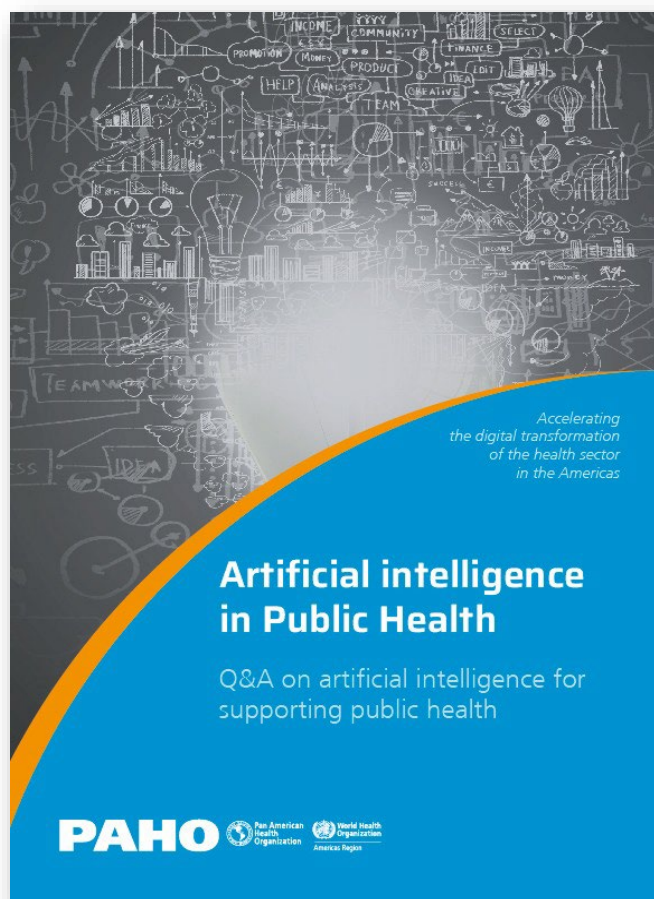
Section 7

Key concepts

Artificial Intelligence in Public health
Readiness assessment toolkit

Toolkit – Section 7 – key concepts

In light of the rapid proliferation of artificial intelligence-driven applications and the heightened levels of anticipation, questions, and uncertainties surrounding their implementation within the public health domain, PAHO is proud to introduce this publication entitled Reference tool to support the exchange of information and promote open conversations and debates.



The primary aim is to foster a deeper comprehension of the genuine capabilities of artificial intelligence (AI) in Public Health, alongside an exploration of potential risks stemming from its inappropriate utilization.

In this document, you will encounter a symphony of insights – where technology harmoniously blends with human expertise to shape the future of public health. Each question invites you to enhance your knowledge and understanding of the potential of AI in Public Health.

The method used was as follows: A group of experts together with internationally renowned figures, convened to discuss the document's scope, question formulation, prompt definition, and scientific sources to support the Q&A processes, and ultimately to

edit and curate some responses generated through an interactive “virtual” dialogue between them and generative and other AI tools. In formulating prompts, a “standard” style was adopted, instructing AI platforms to act as experts in AI and Public Health, serving as scientific writers and professional editors. After agreeing on questions, generative AI tools and scientific literature searches in peer-reviewed sources were employed for the analysis, curation, production and editing of responses. After agreeing on the initial answers and reviewing information sources through expert discussions, some questions were reformulated, repeating the cycle of building responses. This document serves as a reference tool for debates on the potential of generative AI tools.

This document does not aim to be an exhaustive guide on AI for public health. Instead, it provides complementary references for readers to further explore the topic.

Document available at: <https://iris.paho.org/handle/10665.2/59315>



Section 8

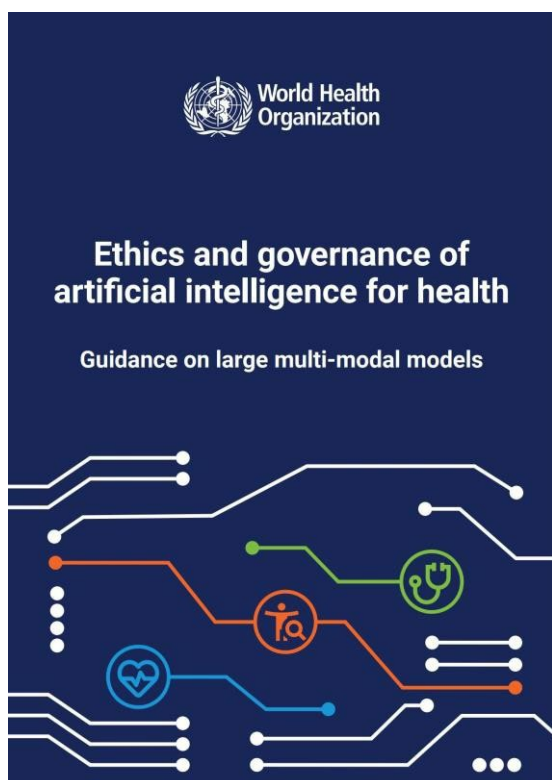
Official documents and reports

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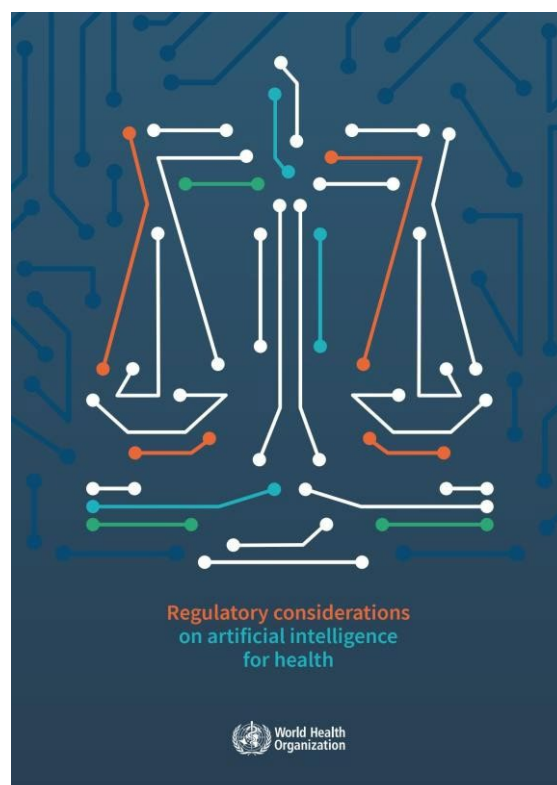
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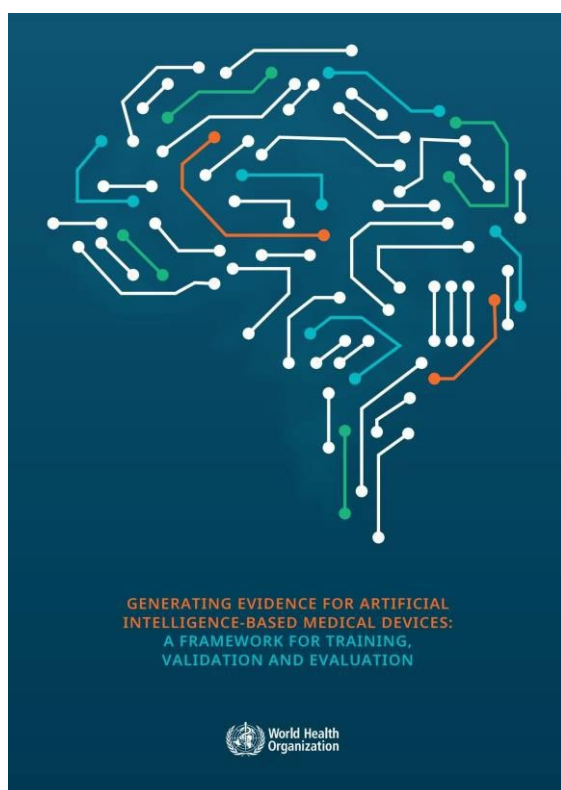
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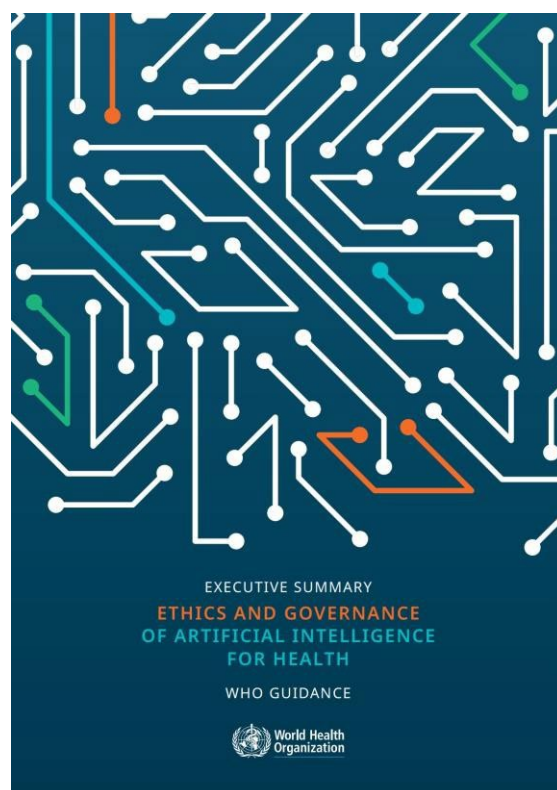
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Section 9

OKRs for the First Year of AI Implementation at the National Level

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Toolkit – Section 9 - OKRs for the First Year of Implementation at the National Level

The following **Objectives and Key Results (OKRs)** are initial suggestions intended to guide the first year of implementing a National AI for Public Health Strategy and Roadmap. These OKRs provide a framework for measuring progress and ensuring successful integration of AI technologies in the health sector. However, it is important to note that these are preliminary recommendations. The final version of the OKRs should be defined by each country, tailored to their unique local realities, available resources, and specific needs. This customized approach will ensure that the AI implementation is both relevant and achievable within the context of each nation's healthcare system.

Objective 1: Establish Digital Health Infrastructure

- Key Result 1.1: Develop and establish a Digital Health Infrastructure Score (See Section 10), measuring the availability, quality, and integration of digital health tools, systems, and technological infrastructure in 50% of health facilities.
- Key Result 1.2: Establish a robust IT infrastructure capable of securely storing and processing large volumes of health-related datasets for use by large language models (LLMs), AI algorithms, and data science techniques in 50% of health facilities.
- Key Result 1.3: Implement electronic health records (EHR) systems in at least 25% of health facilities.
- Key Result 1.4: Set up telemedicine platforms in 30% of health facilities.
- Key Result 1.5: Ensure broadband internet connectivity in 50% of health facilities.

Objective 2: Develop Governance and Regulatory Frameworks

- Key Result 2.1: Draft, propose, and begin implementation of 5 key regulatory frameworks for AI in healthcare, including updates to existing regulations and the development of new ones.
- Key Result 2.2: Engage 80% of identified stakeholders (health professionals, patients, AI developers) in regulatory processes and discussions.
- Key Result 2.3: Conduct 6 workshops to train regulatory bodies on AI principles and regulatory needs.
- Key Result 2.4: Engage with parliamentarians dedicated to public health law or regulations through 4 dedicated sessions.

Objective 3: Build AI Competencies in the Health Workforce

- Key Result 3.1: Develop and launch 6 AI competency training programs for health professionals.
- Key Result 3.2: Complete AI competency training for 50% of targeted health professionals.
- Key Result 3.3: Achieve a 30% improvement in the Health Workforce Readiness Score.

Objective 4: Increase Public Awareness and Engagement

- Key Result 4.1: Develop and distribute 10 educational materials on AI in health to the public.
- Key Result 4.2: Conduct 12 public engagement activities to raise awareness about AI in healthcare.
- Key Result 4.3: Achieve a 40% increase in public trust levels based on surveys and feedback.

Objective 5: Ensure Ethical Compliance and Societal Acceptance

- Key Result 5.1: Finalize and implement comprehensive ethical guidelines for AI use in healthcare.
- Key Result 5.2: Publish 3 public documents addressing the ethical aspects of AI.
- Key Result 5.3: Increase public participation in ethical discussions by 50%.

Objective 6: Improve Data Quality and Accessibility

- Key Result 6.1: Implement advanced data management protocols in 50% of health institutions.
- Key Result 6.2: Ensure 50% of health data meets high standards of accuracy, completeness, and timeliness.
- Key Result 6.3: Establish full data accessibility in 30% of health institutions.

Objective 7: Secure Funding and Optimize Resource Allocation

- Key Result 7.1: Secure long-term funding from 5 major sources for AI projects.
- Key Result 7.2: Utilize 85% of allocated funds for AI projects within the first year.
- Key Result 7.3: Optimize Resource Allocation Plan to cover all AI initiatives effectively.

Objective 8: Implement Initial AI Projects and Integration

- Key Result 8.1: Launch 8 pilot AI projects in health facilities.
- Key Result 8.2: Achieve a 90% success rate for initial pilot projects.
- Key Result 8.3: Fully integrate AI solutions in 25% of existing health systems workflows.

Objective 9: Establish Monitoring and Evaluation Mechanisms

- Key Result 9.1: Develop and finalize comprehensive performance metrics for AI projects.
- Key Result 9.2: Conduct quarterly evaluations of AI project performance based on established metrics.
- Key Result 9.3: Implement continuous improvement processes in 75% of AI initiatives.

Objective 10: Achieve Significant Impact on Health Outcomes

- Key Result 10.1: Document significant improvements in patient outcomes in 25% of targeted areas.
- Key Result 10.2: Measure and report a 30% increase in health system efficiency due to AI integration.
- Key Result 10.3: Publish 5 case studies showcasing the impact of AI on health outcomes.



Section 10

Implementation Roadmap

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Toolkit – Section 10: Implementation Roadmap

The Implementation Roadmap is a crucial section designed to provide a step-by-step guide for countries embarking on the journey of implementing a National AI for Public Health Strategy. This roadmap suggests practical steps, proposing a structured and systematic approach. It is tailored for countries starting from a basic level, offering guidance from the initial stages of planning through to the full implementation and evaluation of AI initiatives in the health sector. It is essential that each country customizes the roadmap to align with their unique local realities, available resources, and specific needs, ensuring relevance and achievability within the context of their health systems. Importantly, the steps outlined are not necessarily sequential and can be implemented in parallel or in different orders based on local context, availability of resources, political priorities, and other relevant factors.

1. Initial Assessment and Planning

- **Conduct a comprehensive needs assessment** to identify the most pressing public health issues and determine how AI can address these challenges.
- **Form an AI Task Force** comprising key stakeholders from the government, healthcare sector, academia, and private industry.
- **Develop a strategic vision and objectives** for the National AI for Public Health Strategy.
- **Secure initial funding** and resources for the planning phase.
- **Involve key stakeholders** to gather insights and build consensus.
- **Determine the budget, human resources, and technological infrastructure** required for the implementation.

2. Building Infrastructure

- **Develop a Digital Health Infrastructure Plan**, including the implementation of EHR systems, telemedicine platforms, and broadband connectivity.
- **Establish a robust IT infrastructure** for secure data storage and processing.
- **Launch pilot projects to test infrastructure** components and gather feedback for improvements.
- **Create a robust data infrastructure** that integrates data from various sources.
- **Implement data quality assurance processes and data management practices** to ensure the reliability and accuracy of data.

3. Governance and Regulatory Frameworks

- **Draft and propose key regulatory frameworks**, including data privacy, ethical use, system validation, interoperability, and governance.
- **Engage with parliamentarians and regulatory bodies** to finalize and adopt these frameworks.
- **Develop new regulatory instruments** and update existing ones to support AI implementation.
- **Establish a governance body** to oversee the implementation, including an AI Council and an Ethics Committee.
- **Develop or adopt standards for data interoperability**, AI model validation, and ethical guidelines for AI use in public health.

4. Capacity Building and Training

- **Develop and launch AI competency training programs** for healthcare professionals.
- **Establish partnerships with academic and training institutions** to support ongoing education.
- **Conduct regular training sessions and workshops** to ensure continuous skill development.
- **Enhance understanding and skills** in AI for healthcare professionals and public health officials.

5. Public Awareness and Engagement

- **Develop and distribute educational materials** to raise public awareness about AI in healthcare.
- **Organize public engagement activities**, including forums, workshops, and media campaigns.
- **Gather and incorporate public feedback** into the AI strategy to ensure transparency and trust.
- **Conduct public awareness campaigns** to educate citizens about the benefits and risks of AI in public health.

6. Implementation of AI Projects

- **Identify and prioritize initial AI projects** based on the needs assessment.
- **Launch pilot AI projects** in selected healthcare facilities and monitor their progress.
- **Scale successful pilot projects to a national level**, ensuring integration with existing health systems.

- **Test AI applications in specific areas** like disease prediction, outbreak detection, and patient management.
- **Develop scalable AI solutions** that can be expanded to cover broader public health needs.
- **Partner with tech companies and research institutions** to leverage their expertise in AI development.

7. Monitoring, Evaluation, and Continuous Improvement

- **Establish a comprehensive performance metrics system** to monitor AI project outcomes.
- **Conduct regular evaluations** of AI initiatives based on established metrics.
- **Implement mechanisms for continuous improvement** and incorporate lessons learned into future projects.
- **Define key performance indicators (KPIs) and Objectives and Key Results OKRs** to measure the effectiveness of AI applications.
- **Establish a feedback loop to continuously monitor**, evaluate, and improve AI systems.

8. Securing Long-term Sustainability

- **Develop a sustainability plan** that includes securing long-term funding sources.
- **Foster partnerships** with international organizations, private sector, and academia.
- **Ensure continuous stakeholder engagement** to maintain support and momentum for AI initiatives.
- **Develop a long-term strategy** for the sustainable use of AI in public health.
- **Secure ongoing funding and investment** to support the continuous development and maintenance of AI systems.



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