

MINISTRY OF HEALTH



Brazilian National Digital Health Strategy

2020

2028

Brasília – DF
2020

MINISTRY OF HEALTH
Executive Secretary
SUS Computer Department

Brazilian National Digital Health Strategy 2020-2028

Brasília – DF
2020

2020 Ministry of Health.



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INTRODUCTION

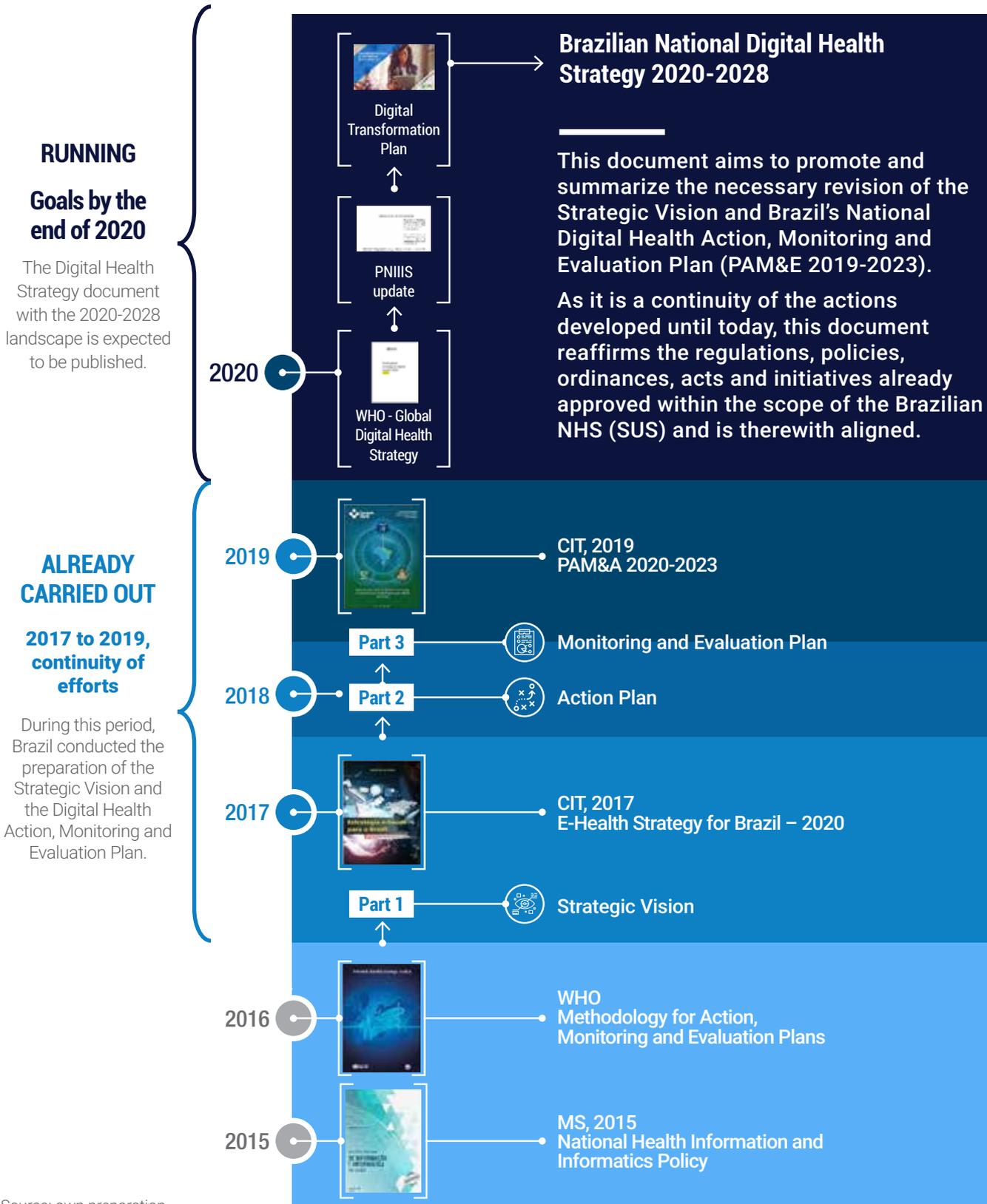
This document presents the Brazilian National Digital Health Strategy with an eight-year vision, that is, until the end of 2028. The Brazilian National Health Strategy for 2028 (ESD28) seeks to systematize and consolidate the work carried out over the last decade, materialized in several documents and, in particular, in the National Policy for Health Information and Informatics - PNIIS (BRAZIL, 2015), published in 2015 and under review in 2020, in the e-Health Strategy for Brazil (BRAZIL, 2017) and in the National Digital Health Ac-

tion, Monitoring and Evaluation Plan (PAM&E 2019-2023), approved in 2019 and published in 2020 (BRAZIL, 2020a). PNIIS establishes the conceptual foundation for Digital Health, including its relationship with other public and health policies, with the National Health Plan (BRAZIL, 2016) and with other Digital Government strategies and initiatives. Thus, this document is in line with previous initiatives and, together with the PNIIS, performs the essential task of updating, expanding and complementing them. Figure 1 provides a graphic representation of this context.



Source: Image - Shutterstock ©.

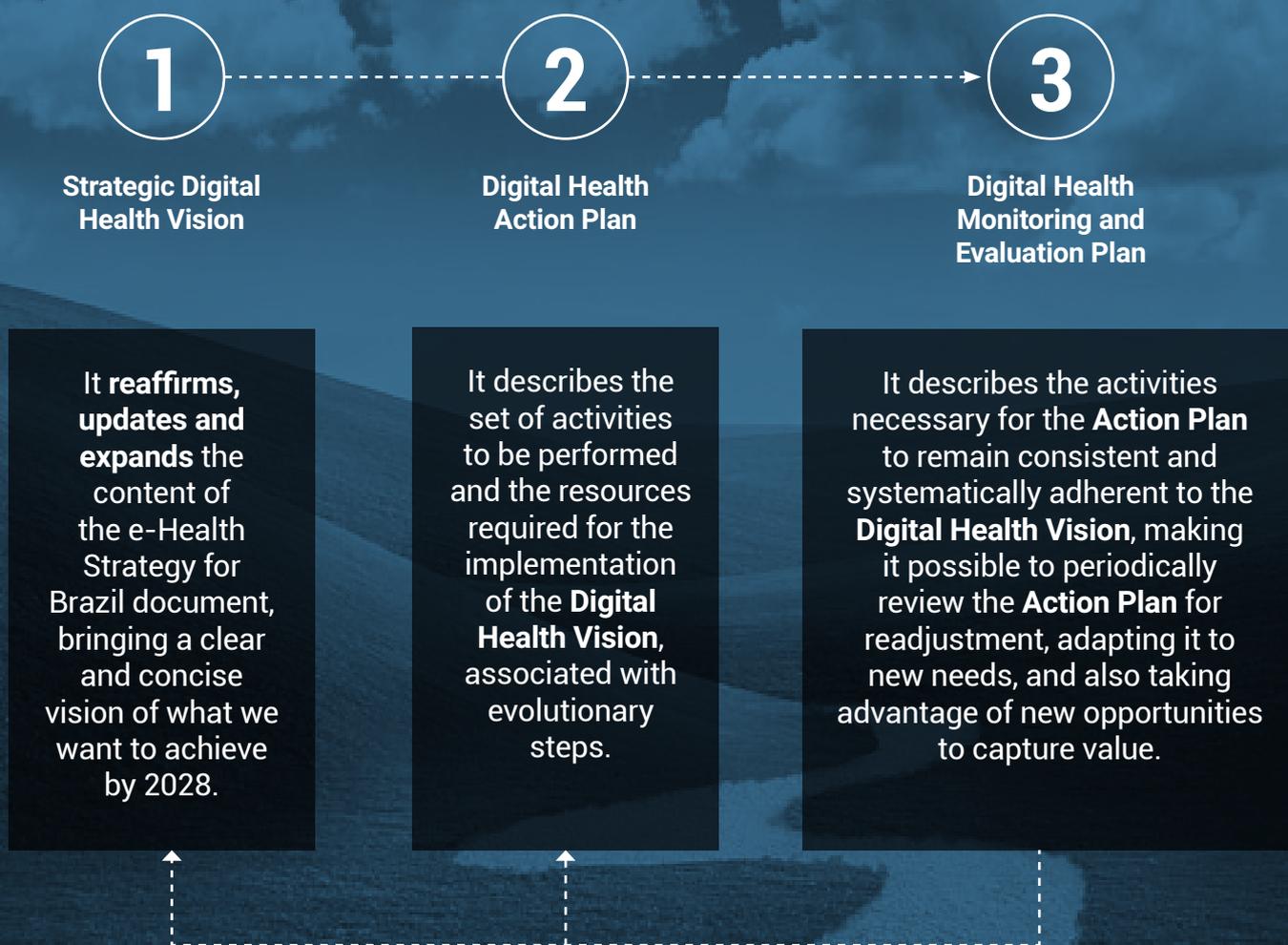
Figure 1 – Schematic contextualization of ESD28



Source: own preparation.

In addition, this document defines the activities that, when executed, will make PNIS more concrete, leading to the Strategic Digital Health Vision for Brazil with a focus on 2028.

ESD28 is presented, in addition to this introduction, in three interrelated parts:



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As this is a progression of the actions developed until today, and with the purpose of turning this into a clear, objective and concise document, the previous documents are not mentioned, except in situations in which they are relevant to understand the context of certain passages or when concepts expressed in previous documents are expanded, updated or otherwise modified.

1.1 THE THREE PILLARS OF ACTION

The formulation of the pillars that guide the Action Plan is based on the understanding that the actions proposed as the central core of PAM&E 2019-2023 will be able to respond to the information needs for the Brazilian NHS (SUS), including integration actions with private health insurance and private healthcare, with a landscape of 2023. These actions are intensive and tend to consume the physical, financial and human resources of the Federal Government and SUS itself and should be strengthened, deepened and disseminated as part of the ESD28.

The first action pillar recognizes the need to strengthen, consolidate, expand and extend beyond the 2023 landscape the actions proposed in PAM&E 2019-2023, especially those established in the Conecte SUS Program and its initiatives: the National Healthcare Data Network (RNDS) and Informatiza APS. These initiatives seek to enable RNDS to offer essential Digital Health services to the country. In addition, RNDS opens the door to interoperability between healthcare information systems in all sectors (BRAZIL, 2020b).

The Brazilian NHS (SUS) conceptually understands and seeks to operationally integrate both Private Health Insurance and Private Healthcare. From the point of view of the healthcare system user, the separation between healthcare data and information used and made available in any of these sectors should not exist, given that healthcare service users can move between public and private healthcare organizations. For the benefit of citizens, healthcare information must be of quality and available when and where it is needed. In addition, there are top notch human, material, organizational and institutional resources in all healthcare sectors, which can and must work closely together. The integration of healthcare information from all sectors is an opportunity brought by Digital Health and implemented by RNDS, requiring collaboration between all stakeholders.



MS actions for the Brazilian NHS (SUS)




Definition of Regulations for Collaboration




Implementation of the Collaboration Space



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Pillars 2 and 3 that guide this Action Plan recognize the essential characteristics of Digital Health that are valid for any country and that, for Brazil, can be expressed as:



THE BEST STRATEGIES

 in Digital Health are led by the government and are inclusive, open and participatory;



THERE IS A MAJOR LACK OF KNOWLEDGE

 and huge distrust among the stakeholders (natural and legal persons) from the public and private sectors, both in Health and in the other industries of healthcare inputs, equipment, services and products;



IT IS URGENT,

 today, that innovation, knowledge and best practices developed in any of the sectors related to Health are quickly tested, validated and put into practice;



DIGITAL HEALTH

 is an extremely complex area of knowledge and practice, due to the diversity of stakeholders and interests, the lack of maturity of healthcare organizations, the scarcity of human resources and trained leaders and, above all, the complexity inherent to healthcare processes;



IT IS EVIDENT

 that the public sector cannot, alone, respond to all the needs of scientific discovery, industrial production, innovation and training of human resources for Health and, even less, for Digital Health.

Thus, pillar 2 aims to build the organizational, legal, regulatory and governance framework that enables effective collaboration in Digital Health between stakeholders who are committed to the purposes and goals to be established as part of the development of this pillar.

Pillar 3 aims to implement a conceptual, normative, educational and technological environment that favors effective collaboration. As the leader of the Action Plan, it is up to the Brazilian NHS (SUS) governance spaces, notably the Tripartite Intergovernment Commission (CIT), to offer regulations, attract partners and promote the legal arrangement of this Collaborative Space. It is up to the Ministry of Health to carry out the necessary actions for the implementation of this space, attracting participants who should be recognized as partners in the initiatives, have creative and action freedom, in addition to participation in decision-making, respecting the rules and regulations formulated in pillar 2.

The coordinated development of the three pillars should provide that:

- the digitization objectives of the Brazilian NHS (SUS), established in PAM&E 2019-2023, are strengthened by innovation initiatives, service models, applications and knowledge, result of collaborative and citizen participation;
- the results of the collaboration, such as service delivery models, knowledge extraction mechanisms, Digital Health applications and epidemiological or health surveillance alerts, for instance, are naturally integrated into the Brazilian NHS (SUS), private health insurance and private healthcare platforms;
- the training of human resources resulting from collaborative efforts has a positive impact on the development of the Digital Health Strategy;
- healthcare organizations, service companies, developers and software and solution providers that participate in the Collaborative Space are better prepared for Digital Health;
- the Collaborative Space is an instrument of economic and social development, for training human, organizational and methodological resources required for Digital Health, an area of great specialization, promoting the emergence of innovative activities of great socioeconomic value;
- ESD28 is created and remains in line with the best practices of Public Management, among which the Federal Government's Digital Transformation objectives stand out;
- ESD28 is aligned and remains inspired by the United Nations Sustainable Development Goals, in particular "Goal 3: Ensure a healthy life and promote well-being for all, at all ages" (UNITED NATIONS, 2015).
- ESD28 maintains the needs identified in the National Healthcare Plan in force and in those that will succeed it as their guide.



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Pillar 1 - MS actions for the Brazilian NHS (SUS)

This pillar recognizes and values the Conecte SUS Program and its initiatives as essential actions for the Digital Health Vision to be achieved. Among the main actions to be developed along this pillar, the following can be highlighted:

- strengthen RNDS initiatives, to take it to all states and jurisdictions;
- strengthen Informatiza APS initiatives to make all healthcare facilities connect to RNDS;
- expand RNDS nationwide, as well as in quantity and quality of services for primary, specialized and hospital care;
- expand and consolidate the Brazilian NHS (SUS) services, in an integrated fashion with private healthcare and private health insurance, in order to expand support for the continuity of care and improve healthcare for the Brazilian population;
- strengthen the Monitoring and Evaluation Plan of the Conecte SUS Program, as described in PAM&E 2019-2023.

Pillar 2 - Definition of regulations for collaboration

This pillar recognizes and values the need to expand and consolidate governance and organizational resources that will support the Digital Health Strategy.

The actions to be carried out in this pillar are those that establish the bases of leadership, governance, investments, regulation, compliance and management that will enable collaboration between stakeholders to develop the Digital Health Strategy and promote the RNDS to reach the proposed scope, asserting itself as national, broad, diverse, safe, reliable and of recognized value to all parties involved.

For the success of this pillar, it is essential to have the leadership of the Ministry of Health as the executor of the Digital Health Strategy, in line with the established regulations, and the institutional sponsorship of the higher levels of the Brazilian NHS (SUS), of the National Health Council (CNS), of the CIT, of tripartite stakeholders, and of intersectoral stakeholders, in increasing collaboration with all sectors of society.

Among the actions to be developed along this pillar, the following can be highlighted:

- explore opportunities for collaboration between stakeholders to support Conecte SUS;
- define governance and organizational resources for collaboration;
- identify the needs of human resources for Digital Health and seek their provision;
- identify the needs for standards and terminologies for collaboration in order to enable ESD28;
- identify the innovation initiatives ongoing in the country, in areas such as Intelligence of Things (IoT), Big Data, open data, startups, among other national and international trends;
- identify international initiatives and strengthen existing collaborations.



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Pillar 3 - Implementation of the collaborative space

This pillar aims to implement the Collaborative Space of the Digital Health Strategy as a conceptual, virtual, distributed, logical and physical space that enables collaboration between all stakeholders in Digital Health, with clear definitions of expectations, roles and responsibilities. The proposed collaboration is not exclusively technological and seeks to include models, services, methods and knowledge that are made possible or made more efficient by the use of Digital Health.

For the actions developed along this pillar to effectively contribute to the development of the Digital Health Strategy, it is essential that they be initiated and stimulated by the Ministry of Health. The fundamental role of the Ministry of Health, as executor of the activities of this pillar, is that of catalyst for collaborative actions, that is, the MS, whether or not it is effectively collaborative in each of the actions, is the agent that accelerates the collaboration between the stakeholders, facilitates, organizes and

enables an environment of motivation and provides that essential collaboration regulations are respected, valued and continuously improved.

The main actions to be developed along this pillar can be summarized as:

- implement the space for intersectoral and inclusive collaboration;
- expand the relevance and intersectorality of ESD;
- establish a systematic and permanent communication plan, including mechanisms, channels and content with all public and private stakeholders;
- attract relevant public and private stakeholders for collaboration;
- establish mechanisms for monitoring and evaluating the Collaboration Space's actions.



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1.2 DIGITAL HEALTH STAKEHOLDERS AND COOPERATION EXPECTATIONS

As described in previous documents, Digital Health has a set of relevant stakeholders for the Strategy to develop. In particular, given its collaborative nature, ESD28 will only be successful if a wide range of stakeholders are attracted to act as recognized and committed partners, institutional or financial sponsors, committed contributors providing knowledge or resources in general, or engaged users who seek to extract the maximum from Digital Health for their own or collective benefit. Certainly, these roles may vary between initiatives, ESD28 phases, seasonality of interests and even availability of resources, but it is certain that

the active and intense participation of all the stakeholders of Health will be, in itself, the success of the digital platform of innovation, information and services for the Digital Health Strategy.

The set of stakeholders relevant to Digital Health is diverse and broad, since it covers from the healthcare service user - the center of the ESD28 - to the paying sources for healthcare services and regulatory agencies. In favor of concision, without loss of precision, the set of stakeholders identified as relevant to the ESD28 and the high level expectations of their participation are shown in Table 1.



Source: Image - Shutterstock ©.

Table 1 – List of Relevant Stakeholders for ESD28

PLAYER	DESCRIPTION
Federal government	The Federal Government of Brazil is the Executive Power within the scope of the Union. The political-administrative organization of the Federative Republic of Brazil comprises the Union, the States, the Federal District and the Municipalities, all autonomous, under the terms of the Constitution.
National Health Council (CNS)	The CNS is a permanent and deliberative collegiate body, part of the regulatory structure of the Ministry of Health, composed of representatives of the government, service providers, healthcare professionals and users, whose decisions, embodied in resolutions, are ratified by the Minister of Health.
Triparty Intergovernment Commission (CIT)	The CIT, linked to the Ministry of Health for operational and administrative purposes, is a collegiate body for articulation, negotiation and agreement between healthcare managers of the federal entities for the operationalization of public health policies within the scope of the Brazilian NHS (SUS).*
National Council of Health Secretaries (CONASS)	CONASS is a private, non-profit entity that is composed of the health secretaries and their legal substitutes, official managers of the State Departments of Health of the states and the Federal District, representing the state entities in the deliberative instances of the Brazilian NHS (SUS).*
National Council of Municipal Health Secretariats (CONASEMS)	CONASEMS is a civil association, a legal entity of private law, non-profit, of indefinite duration, whose purpose is to bring together the Municipal Departments of Health or equivalent bodies and their respective secretaries or the holder of an equivalent function to act in favor of public healthcare development, universal and equal access of the population to healthcare actions and services, promoting joint actions that strengthen the political, administrative and financial decentralization of the Brazilian NHS (SUS).*
Ministry of Health - business areas	The Ministry of Health is the body of the Federal Executive Power responsible for the organization and preparation of plans and public policies aimed at the promotion, prevention and health care of Brazilians. Business areas in this document are considered to be the Specific Organs represented by the six secretariats that comprise it: Primary Healthcare Secretariat (SAPS), Secretariat of Specialized Health Care (SAES), Secretariat of Science, Technology, Innovation and Strategic Health Inputs (SCTIE), Health Surveillance Secretariat (SVS), Special Indigenous Health Secretariat (SESAI), Labor Management and Health Education Secretariat (SGTES) and the departments linked to the Executive Secretariat (SE) of the Ministry of Health.
Ministry of Health - Informatics Department of the Brazilian NHS (SUS) (DataSUS)	DataSUS is a body of the Executive Secretariat of the Ministry of Health, whose mission is to promote modernization through Information Technology to support the Brazilian NHS (SUS).
National Health Surveillance Agency (Anvisa)	Anvisa is a federal regulatory agency, whose institutional purpose is to promote the protection of the population's health, by means of sanitary control of the production and consumption of products and services subject to sanitary surveillance, including environments, processes, inputs and technologies related to them, as well as the control of ports, airports, borders and bonded areas.
National Private Health Insurance and Plans Regulatory (ANS)	The Federal Government of Brazil is the Executive Power within the scope of the Union. The political-administrative organization of the Federative Republic of Brazil comprises the Union, the States, the Federal District and the Municipalities, all autonomous, under the terms of the Constitution.

(to be continued)

PLAYER	DESCRIPTION
Municipal Departments of Health (SMS)	SMS are responsible for planning, developing, guiding, coordinating and executing the healthcare policy of the municipalities, comprising both outpatient and hospital care. It is also their responsibility to plan, develop and carry out healthcare and epidemiological surveillance actions.
State Departments of Health (SES)	SES coordinate and plan the Brazilian NHS (SUS) at the state level, respecting federal standardization. State managers are responsible for organizing healthcare in their territory, participate in the formulation of healthcare policies and actions, provide support to municipalities in conjunction with the state council and participate in the Biparty Intergovernment Commission (CIB) to approve and implement the State Health Plan.
Healthcare System Service Providers	Private healthcare institutions (care includes all the actions necessary for disease prevention and health recovery, maintenance and rehabilitation) that work in the provision of services within the scope of the Brazilian NHS (SUS).
Healthcare System Paying Sources	Agent, institution or entity responsible for financing healthcare actions and services.
Industry and technology sector	Public or private institutions that act as suppliers of inputs, products, services or technologies to healthcare service providers, managers or paying sources of the healthcare system.
Professional associations and councils	Professional associations or councils are representative entities formed by professionals from each area with the mission of regulating the exercise of professional activity and supervising their performance, thus guaranteeing the security of society and the interests of the profession.
Development agencies and bodies	Development agencies or bodies are public or private institutions that work with the main objective of financing fixed and working capital to open or expand enterprises that promote regional economic development, scientific or technological research, human resources training or innovation in companies, universities, technological institutes and other similar public or private institutions in the country.
Technical-scientific societies	Non-profit entities of private law, whose mission is to promote and foster knowledge related to their area of activity, contributing to the spread of good practices, promote meetings and events to discuss and disseminate scientific updates and other topics object of their studies, promote exchange and encourage the evolution and innovation of the sector.
Academy and training centers	Institutions of multidisciplinary higher education and of formation of professional staff with higher education, research, extension and mastery and cultivation of human knowledge.
Oversight bodies	Bodies and entities with the functions of formulating strategies, controlling and supervising the execution of public policies, including in economic and financial aspects, and, at the same time, creating mechanisms to improve governance and the use of public goods, values and money.
Consumer advocacy bodies	Bodies and entities responsible to carry out consumer protection in Brazil through the dissemination of information on the sale of goods and the provision of services, in addition to guaranteeing the rights of consumers provided for in the current legislation.
Patient advocacy groups	Patient associations are entities that group and represent citizens in an illness condition and aim to help these individuals receive appropriate treatment, give visibility to available treatments, as well as promote positive changes in communities at the public healthcare level to gain access to them.
Citizens (individuals)	Every being of the human species integrating the social organism.

Source: own preparation.

*Law No. 12.466/2011 (BRAZIL, 2011).

The possibilities for active participation are also numerous, they have several degrees of intensity and commitment and can occur in combinations. Table 2, below, summarizes the five types of participation expectations adopted in this document.

Table 2 – Type of Cooperation Expected in ESD28

 <p>LEADERSHIP</p>	<p>Leadership implies assuming the responsibility for organizing governance capable of coordinating the allocation of human and financial resources and the execution of activities to achieve the objectives set for each delivery.</p> <p>Those with the role of leading are expected to develop strategies and action plans for the direct or indirect execution of the activities necessary to achieve the planned objectives, to establish partnerships and seek sponsorship and contribution, in addition to engaging the stakeholders impacted by their initiatives. Leaders have accountability towards deliveries, so they must continually monitor, evaluate and improve solutions to ensure that expectations are met.</p>
 <p>PARTNERSHIPS</p>	<p>The stakeholders responsible for the composition of partnerships must be able to dedicate human and financial resources and to respond to the governance structure established by the leadership, being subject both to the direct execution of activities and to playing a role in the development and implementation of partnerships for execution of activities necessary to achieve the leadership objectives.</p> <p>Those responsible for forming partnerships are expected to have both institutional involvement and accountability for achieving the objectives set by the leadership for the established partnerships.</p>
 <p>SPONSORSHIP</p>	<p>Sponsorship consists of institutional support or through financial, technological and human resources for the structuring of mechanisms and solutions that assist the leaders of the initiatives in the different phases of their projects.</p> <p>Those responsible for the sponsorship are expected to be able to support or allocate resources for support at various times when deemed appropriate, with sponsors not being responsible for responding to the delivery of results or achieving the objectives set for projects under the leadership.</p>
 <p>COLLABORATION</p>	<p>The collaborative role is a key element so that stakeholders with notorious knowledge and previous experience in different initiatives can disseminate their knowledge to the leadership or to the strategic partners involved.</p> <p>Contributors are expected to commit to being consulted and taking a purposeful attitude to assist in the process of co-creating solutions, developing suggestions for improvements and raising guidelines for initiatives brought by the leaders.</p>
 <p>ENGAGEMENT</p>	<p>The stakeholders to be engaged are those who need to be informed of decisions, regulations and practical actions of initiatives under leadership management that may have an impact on their daily lives.</p> <p>Those to be engaged are expected to be able to absorb leadership reports and to take a collaborative role in informing leaders about the impacts arising from their actions, aiming to reach a fair outcome that takes into account the needs of all parties involved.</p>

Source: own preparation.

In addition to this high-level description, each action presented in this document visually details the cooperative expectations of each class of player.

2



STRATEGIC DIGITAL HEALTH VISION FOR BRAZIL

The Strategic Vision presented in the e-Health Strategy for Brazil document, published in 2017, states that:

By 2020, e-Health will be incorporated into the Brazilian NHS (SUS) as a fundamental dimension, being recognized as a strategy for the consistent improvement of Healthcare services through the provision and use of comprehensive, accurate and secure information that streamlines and improves the quality of Healthcare and processes, in the three spheres of government and in the private sector, benefiting patients, citizens, professionals, managers and healthcare organizations (BRAZIL, 2017, p. 9).

Such vision, proposed with a 2020 landscape, as well as the strategic actions recommended in that document, contributed to a series of initiatives developed by the Ministry of Health. The current 2019-2023 Action, Monitoring and Evaluation Plan sets a relevant milestone for establishing integrated programs and projects that, by the end of 2023, will put Digital Health on a new level in Brazil (BRAZIL, 2020a).



The initiative of the National Healthcare Data Network (RNDS), part of the Conecte SUS Program, both institutionalized by ordinance GM/MS No. 1.434, dated May 28, 2020, establishes the concept of a standardized, modern and interoperable platform of services, information and connectivity that is, in itself, transformative for Health.

RNDS establishes as its objective:

“to promote the exchange of information between the points of the Healthcare Network (RAS), allowing the transition and continuity of care in the public and private sectors” (BRAZIL, [2020]).

Source: Image - Shutterstock ©.

The conceptual framework and practice brought by RNDS allow us to propose a Strategic Digital Health Vision for Brazil, with a 2028 landscape, which is easily understandable, inspiring and conceptually robust, formulated as:



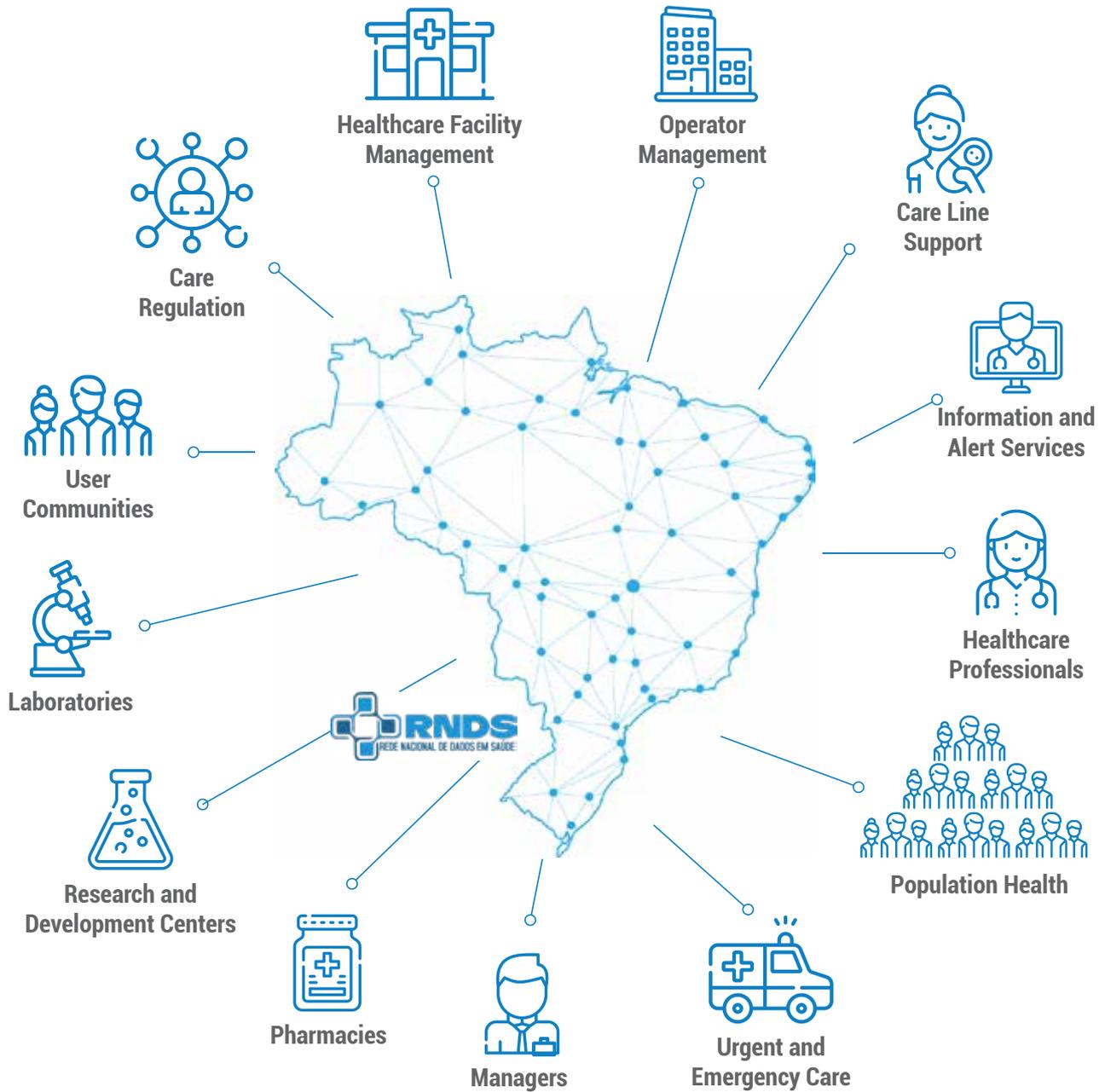
By 2028, RNDS will be established and recognized as the digital platform for innovation, information and healthcare services for all Brazil, for the benefit of users, citizens, patients, communities, managers, healthcare professionals and healthcare organizations.

Source: Image - Freepik ©.

Strategic Vision with a 2020-2028 landscape

This vision, represented graphically in Figure 2, updates the Digital Health concepts accumulated to date and provides a precise objective to be achieved in eight years.

Figure 2 – Schematic representation of RNDS as a national platform for innovation, information and digital healthcare services



Source: own preparation.

3



DIGITAL HEALTH

ACTION PLAN 2020 – 2028

The Digital Health Action Plan for Brazil 2020-2028 describes the set of activities to be performed and the resources necessary for the implementation of the Digital Health Vision, associated with evolutionary stages. The Plan was designed around the three main pillars of action and seven priorities that, when met, will gradually lead to the Vision.

The Plan was designed around the three main pillars of action and seven priorities that, when met, will gradually lead to the Vision.



Source: Image - Pexels ©.

3.1 PRIORITIES FOR THE ACTION PLAN

The Action Plan describes the set of activities to be performed and the resources necessary for the implementation of the Strategic Digital Health Vision, guided by the three pillars of action and associated with evolutionary steps.

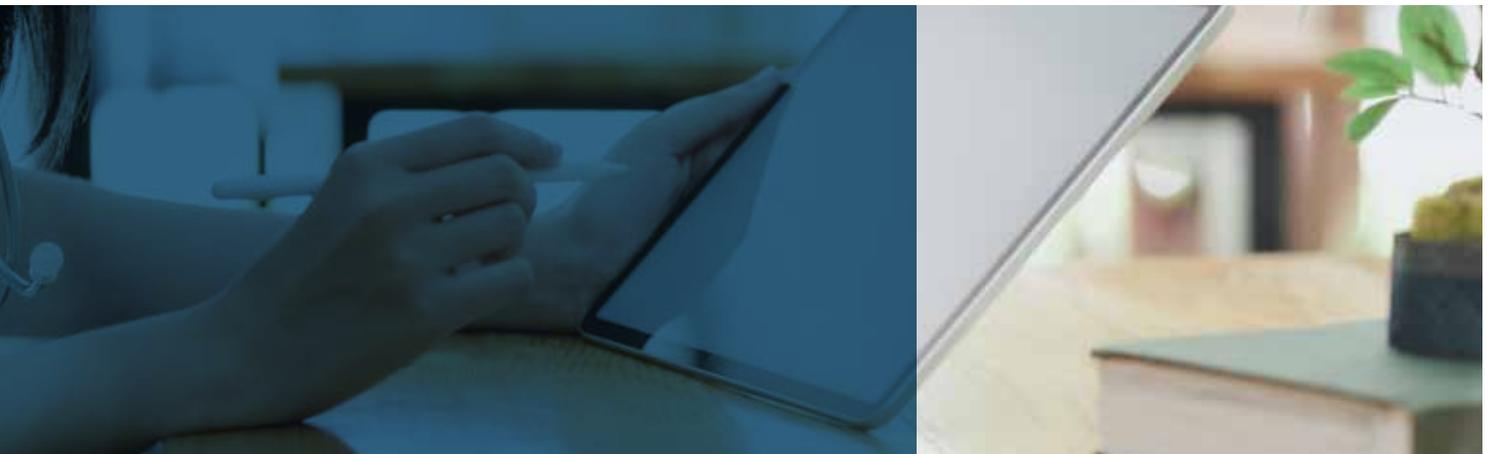
The actions to be developed were selected considering the identification of essential priorities for Digital Health. It is understood that fully achieving the identified priorities will lead to the implementation of the Strategic Digital Health Vision for Brazil.

As always, when proposing strategic development plans, these priorities are interrelated and dialogue with each other. In addition, such priorities will be devel-

oped along the three proposed pillars, possibly – although rarely – confined to only one of them.

The priorities are detailed in sub-priorities, and these, in turn, are divided into actions that aim to respond to the presented priorities. It is not expected that the proposed actions will be carried out at the same time, but it should be noted that some of them are already in progress, and that certain actions collaborate to make others feasible. The following sections include a graphical representation of expected deadlines for each action.

The seven identified priorities are summarized in Figure 3 and detailed below.



Source: Image - Pexels ©.

Figure 3 – Seven priorities identified



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Figure 4 – Priorities, Sub-Priorities and Strategic Actions



1. Governance and Leadership for ESD

1.1 Institutionalization of ESD

1.1.1 Consolidation of formal ESD instruments

1.2 ESD Leadership and Governance

1.2.1 Establish and implement the ESD Governance Model

1.3 Legislation and Regulation for SD

1.3.1 Define and develop LGPD initiatives
1.3.2 Establish the Regulation for Innovation and Interconnectivity Ecosystems

1.4 Financing of ESD

1.4.1 Access the sources of Public Funding
1.4.2 Establish mechanisms for Private Funding



2. Digitization of the 3 Levels of Care

2.1 Digitization of Healthcare Facilities in the Country

2.1.1 Perform the expansion of Connectivity (internet)
2.1.2 Expand the Computerization of Primary Care
2.1.3 Expand the computerization of other levels of care



3. Support for Improving Healthcare

3.1 Support for Continuity of Care at all levels

3.1.1 Supporting Care Lines

3.2 Healthcare Promotion and Disease Prevention

3.2.1 Ensure support for RAS (reference and counter-reference)
3.2.2 Provide support to Population Health management

3.3 Promotion of Telehealth and Digital Services

3.3.1 Integration of Telehealth and Digital Services into the assistance flow



4. The User as Protagonist

4.1 User Engagement

4.1.1 Develop actions for the engagement of citizens
4.1.2 Develop actions for the engagement of healthcare professionals

4.2 Information platforms for citizens and users

4.2.1 Deploy Personal Health Record services

(to be continued)

(continuation)



5. Human Resources Education and Training

5.1 Training in Health Informatics

- 5.1.1 Promote training of Health Professionals and Managers
- 5.1.2 Promote training for IT professionals

5.2 Valuing Human Capital in Digital Health

- 5.2.1 Health Informatics as a profession and R&D area



6. Interconnectivity Ecosystem

6.1 Interoperability with third party Systems

- 6.1.1 Promote interoperability with Primary Care
- 6.1.2 Promote interoperability with Laboratories
- 6.1.3 Promote interoperability between levels of care
- 6.1.4 Promote interoperability with pharmacy services
- 6.1.5 Promote interoperability with telehealth services
- 6.1.6 Implement Outpatient Regulation services

6.2 Standards and Terminologies

- 6.2.1 Strengthen National health terminology server
- 6.2.2 Develop standards for healthcare information



7. Innovation Ecosystem

7.1 Expansion of RNDS Integrated Services

- 7.1.1 Promote support for Assistance Contact
- 7.1.2 Develop Health Surveillance initiatives
- 7.1.3 Implement Electronic Prescription services
- 7.1.4 Implement Regulation Services

7.2 Distributed innovation ecosystem

- 7.2.1 Develop initiatives in IoT, Big Data and secondary use of data
- 7.2.2 Deploy the Health Information Data Lake

7.3 Value-based Health

- 7.3.1 Explore value-based healthcare models

7.4 Assessment and Incorporation of new technologies

- 7.4.1 Support the incorporation of innovations
- 7.4.2 Using translational research features

Source: Images - Shutterstock © .





GOVERNANCE AND LEADERSHIP FOR ESD

Ensure that the ESD is developed under the leadership of the Ministry of Health but, at the same time, is able to incorporate the active contribution of external stakeholders who participate in the collaboration platforms.

Priority 1: Governance and leadership for ESD

1.1 INSTITUTIONALIZATION OF ESD

1.1.1 Consolidation of formal ESD instruments

1.2 ESD LEADERSHIP AND GOVERNANCE

1.2.1 Establish and implement the ESD governance model

1.3 DIGITAL HEALTH LEGISLATION AND REGULATION

1.3.1 Define and develop initiatives aligned with the LGPD

1.3.2 Establish the regulation of innovation and interconnectivity ecosystems

1.4 FINANCING THE DIGITAL HEALTH STRATEGY

1.4.1 Access sources of public funding

1.4.2 Establish mechanisms for private financing

Priority 1: Governance and leadership for ESD

The implementation of Digital Health actions for Brazil is responsibility of the Ministry of Health, as it is the body with the necessary legitimacy to develop a Digital Health Strategy that represents the interests of state and municipal managers and the population, in accordance with the principles of the Brazilian NHS (SUS) and aligned with the CNS and CIT regulations. As recommended in the 2017 e-Health Strategic Vision for Brazil document, the Ministry should also seek to expand the intersectorality of Digital Health initiatives, attracting other Government bodies to work together.

Understanding that it is necessary for Digital Health to reach all Brazilians, the Ministry of Health must also formulate policies that enable the joint action of Government bodies and federated entities with other public and private organizations that are committed to healthcare socioeconomic development and who are willing to participate in a major pact for the development and implementation of the Digital Health Strategy proposed in this document, in the form of collaboration between multiple stakeholders to meet the multiple needs of the Brazilian healthcare system, for the benefit of all, as stated in the Vision statement, previously mentioned.

Expected benefits of this action for citizens and for the Brazilian health-care system:

- leadership and governance processes for the Digital Health Strategy established and capable of attracting and engaging Government sectors, relevant Healthcare stakeholders and members of the scientific and technological community, essential aspects to achieve the Strategic Vision;
- a stable, productive and collaborative environment oriented to the country's needs, with clear attributions, regulatory mechanisms, responsibilities and expectations that, thus, offer legal certainty, facilitate cooperation between the relevant Healthcare stakeholders and, therefore, lead to results that benefit the entire Healthcare System;
- applied results, such as processes, methods, equipment, technologies, knowledge and models of innovative healthcare services that benefit users, professionals, managers and healthcare organizations.

For this priority to be achieved, at least the sub-priorities described below are required to be developed, with their priority actions.

1.1 INSTITUTIONALIZATION OF ESD

This sub-priority, which is already under development, aims to establish regulations in the National Health Information and Informatics Policy (PNIIS) for the Digital Health Strategy to be developed in an efficient, transparent and effective fashion, in order to enable the Digital Health Vision to be achieved as proposed.

1.1.1 Consolidation of ESD formal instruments

This action consists of identifying and mobilizing the group of professionals who will review the National Health Information and Informatics Policy (PNIIS) and collect contributions from specialists and external organizations, submitting the result to the various higher levels of the Ministry of Health and the Brazilian NHS (SUS), for review, approval and publication. The relationship between PNIIS and ESD must be clearly defined and these two important documents must be harmoniously complementary.

Of the various activities to be developed to meet this priority, we can mention:

- review of existing public policies related to Digital Health in Brazil;
- analysis of public Digital Health policies adopted in countries with healthcare systems similar to those of Brazil;
- identification of best practices for the preparation and publication of Digital Health policies;
- analysis of the international scenario of the relationship between Digital Health policies and strategies;
- proposition of the scope of the PNIIS review;
- submission of national policy approval processes;
- publication.

The activities that form the scope of the Consolidation of ESD Formal Instruments started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 5.

Figure 5 – Estimated time to perform this action



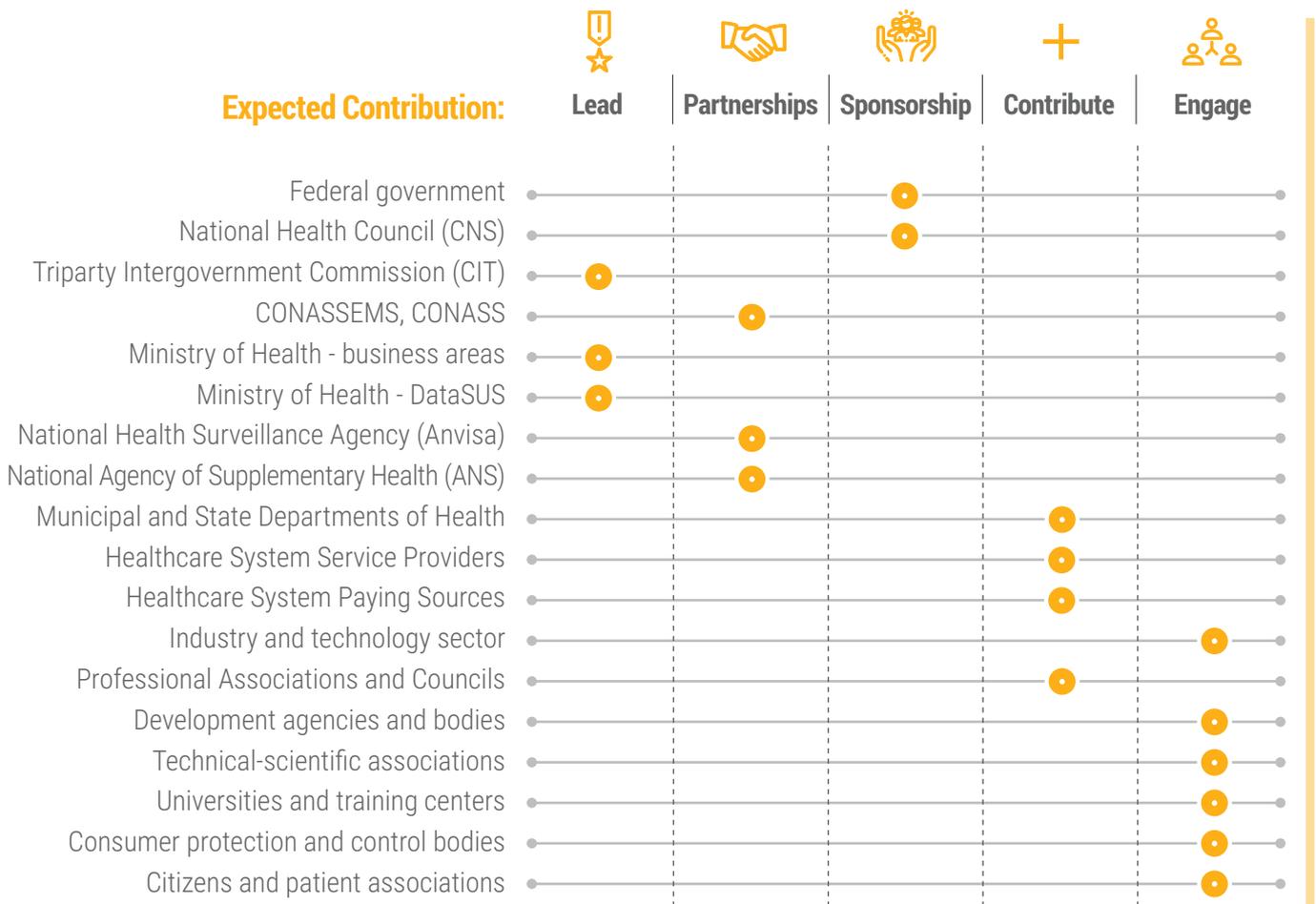
Source: own preparation.

EXPECTED BENEFITS:

- existence of a national policy adhering to the needs and interests of the Brazilian NHS (SUS), which offers regulations and guidance for the development of ESD, in harmony with other public policies and initiatives.

EXPECTATION OF COOPERATION:

Figure 6 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

1.2 ESD LEADERSHIP AND GOVERNANCE

For the Ministry of Health to be able to exercise its leadership effectively and for all public or private stakeholders that are willing to participate in the pact for ESD28 to have their expectations understood and clarity of their roles and responsibilities, a structure of governance of the Digital Health Strategy that respects the attributions and legal competencies of governmental bodies but, at the same time, incorporates the participation of external organizations to enable the actions to be developed along pillars 1, 2 and 3 of the Action Plan is required to be in force.

1.2.1 Establish and implement the ESD governance model

The current governance model, aimed to support the Conecte SUS Program, will need to be expanded as the RNDS expands. In addition, a productive Collaboration Space, between public, private healthcare and private health insurance stakeholders, the focal point of ESD28, requires a governance model that addresses the ethical and legal needs, as well as the participants' capacities, vocations, limitations and expectations.

Among the actions to be developed to achieve this priority, the following can be mentioned:

- identification of governance needs for the expansion of Conecte SUS;
- identification of stakeholders to build and validate the proposed model;
- identification of needs, expectations and requirements for collaboration;
- analysis of governance models for collaboration and innovation in Digital Health;
- identification of the institutionalization process of the proposed governance model;
- publication and implementation of the ESD governance model.

The activities that form the scope of the Establishment and Implementation of the ESD Governance Model started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 7.

Figure 7 – Estimated time to perform this action



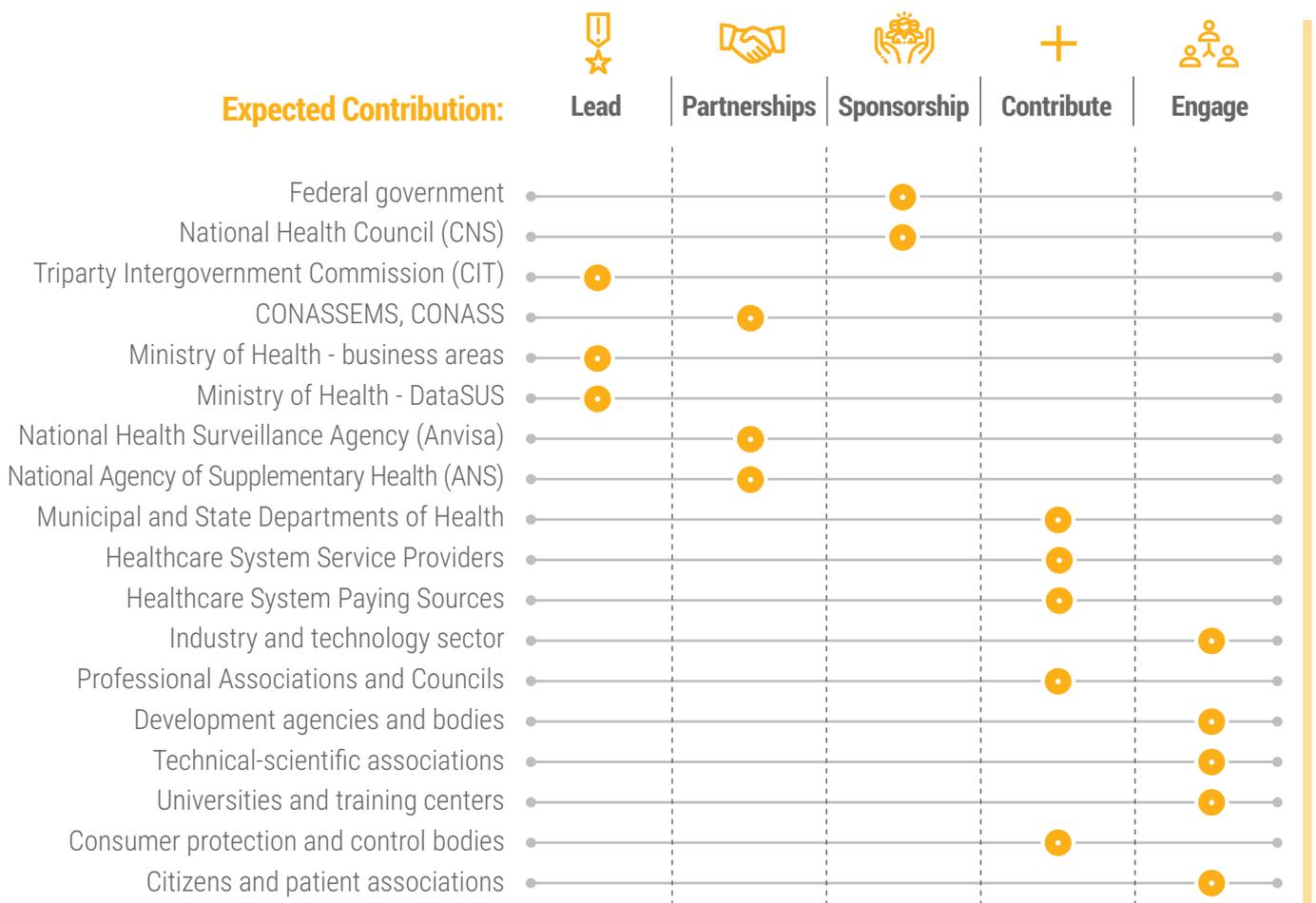
Source: own preparation.

EXPECTED BENEFITS:

- organizational structure that provides freedom of action for all, respecting the proposed rules and objectives.

EXPECTATION OF COOPERATION:

Figure 8 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

1.3 DIGITAL HEALTH LEGISLATION AND REGULATION

To be successful, Digital Health requires the existence of legislation that offers legal certainty to all those involved, guaranteeing essential rights such as confidentiality and data privacy. Thus, the Regulatory Framework is essential especially to guide users and stakeholders in general about what is expected of them, whether acting as users or suppliers of Digital Health products or services.

1.3.1 Define and develop initiatives in line with LGPD

Digital Health initiatives must be aligned with the General Data Protection Law (LGPD). In addition to the need to comply with legislation, the LGPD must be understood as a set of good practices that offers security for users of Digital Health services. This action, which is already under development, should evolve as the RNDS expands, both in geographic scope and in the diversity of services offered (BRAZIL, 2019a).

Among the main activities to be developed to advance this priority are:

- identification of critical points of alignment with the LGPD for the expansion of the RNDS;
- identification of healthcare data sharing models aligned with the LGPD;
- proposition of robust models of informed consent that are easy to understand, implement and adhere to by the patient, in line with the precepts of the LGPD;
- proposal for authentication, security, confidentiality and privacy models in line with the LGPD.

The activities that form the scope of the Definition and Development of LGPD Initiatives started in 2020. The estimated time to carry out this action throughout the ESD is illustrated in Figure 9.

Figure 9 – Estimated time to perform this action



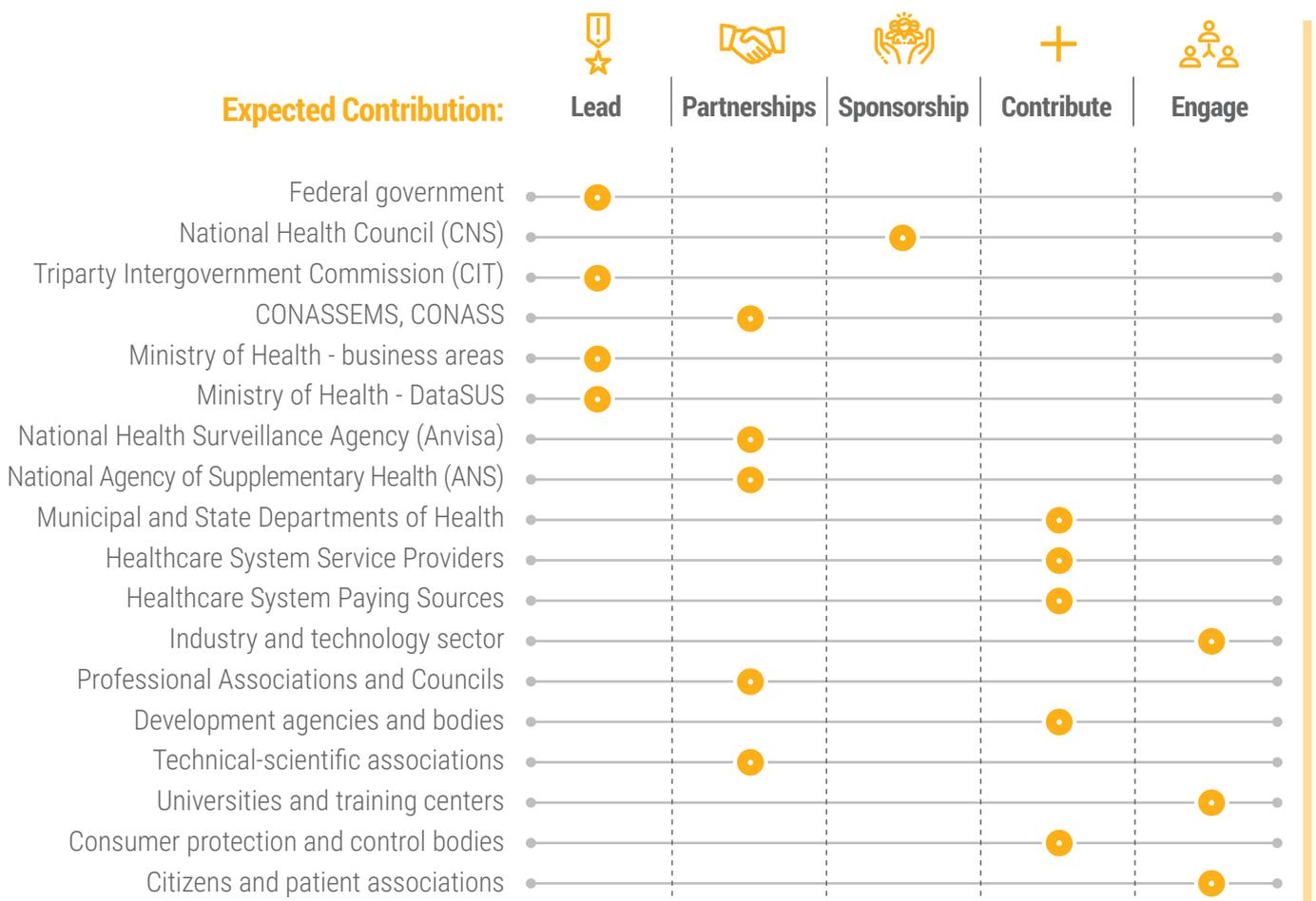
Source: own preparation.

EXPECTED BENEFITS:

- promoting security, privacy and confidentiality of data, in order to generate legal certainty, benefiting users, professionals, managers and organizations;
- strengthening the credibility of Digital Health, allowing greater adoption, by all stakeholders, and, thus, greater reach of the benefits of Digital Health, with lower risks.

EXPECTATION OF COOPERATION:

Figure 10 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

1.3.2 Establish the regulation of innovation and interconnectivity ecosystems

For the collaborative initiatives in Digital Health, one of the essential building blocks of ESD28, to be implemented, it is necessary that, in addition to compliance with the LGPD's dictates, the rules for participation, information exchange, financing and use of the results of the collaboration are clearly established and aligned. Regulatory mechanisms must be defined and practiced, thus allowing collaboration between stakeholders to take place in a legally secure and transparent manner for citizens, control bodies and civil society in general.

For RNDS to expand and become the backbone of the National Platform for Digital Health Information and Services, it is necessary that technologies, concepts, standards and information models incorporated by it be disseminated and shared with all participants in the Collaboration

Space. In addition, it is essential to define ethical criteria, purpose of use and legal responsibility, as proposed in previous actions, which, once met, allow controlled and regulated access to the RNDS as well as the existing data, always with interest in achieving the Digital Health Vision.

The activities to be developed include:

- identify and attract relevant stakeholders;
- establish the legal and organizational framework for the regulation of collaboration;
- implement, evaluate and continuously improve the regulatory processes.

The activities that form the scope of the Establishment and Regulation of Innovation and Interconnectivity Ecosystems are scheduled to start in late 2020. The estimated time to perform this action along the ESD is shown in Figure 11.

Figure 11 – Estimated time to perform this action



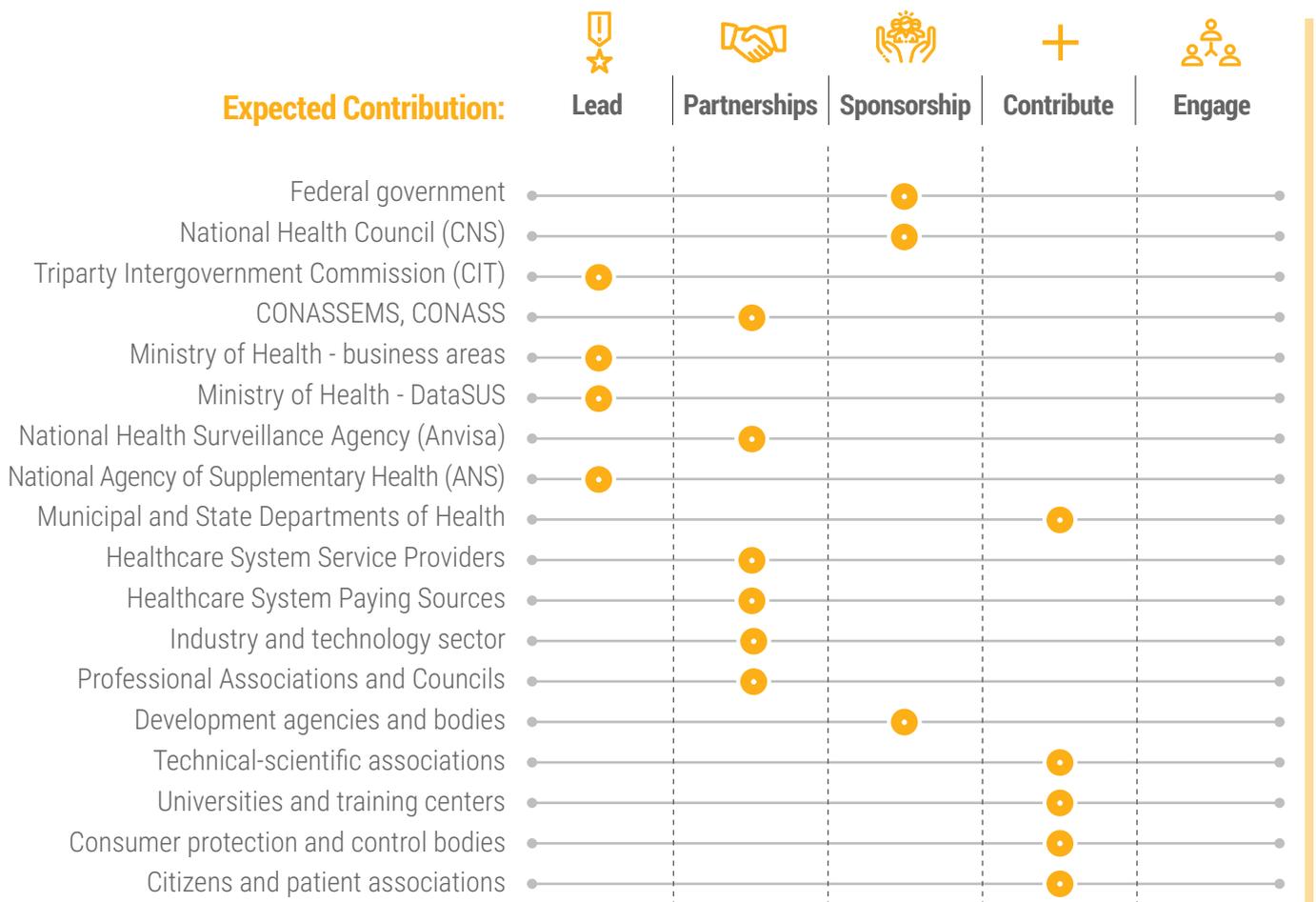
Source: own preparation.

EXPECTED BENEFITS:

- definition of clear and public rules for collaboration and for access to data and information, in line with existing legislation and with the interests of relevant stakeholders, enabling a productive, motivating and safe Collaboration Space;
- clarity of the rules for using the results of the collaboration, allowing all stakeholders to combine resources, expectations and opportunities, in compliance with current legislation.

EXPECTATION OF COOPERATION:

Figure 12 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

1.4 DIGITAL HEALTH STRATEGY FUNDING

The development and implementation of the Digital Health Strategy require financial resources, both in investment and in funding. As in the digital transformation process in other sectors, such as banking, for example, the sources of financial resources are numerous and should not be exclusively governmental. The use of these resources must be defined in the PNIS, but identifying and accessing sources of financial resources is a priority activity, to be defined as part of the Action Plan.

1.4.1 Access public funding sources

This action is already being developed to provide funding for the Conecte SUS Program on all fronts.

The initiatives of RNDS expansion and infrastructure programs developed by the Ministry of Health through DataSUS could and should use federal public funding, as is currently the case. For the new initiatives to be developed as part of the ESD28, additional public resources will

be needed, which may be exclusively federal or, eventually, contributed by states and municipalities, in compliance with the relevant legislation.

This action aims to identify the demands of public resources and the potential sources of financing, as well as to establish the mechanisms that make public ESD actions feasible.

The activities to be developed include:

- to identify possible sources of public funding, in the three spheres of government, by profile and lines of funding and ways of obtaining financial resources, among other aspects;
- to plan the approach and prepare documentation for obtaining these financial resources, mobilizing partners and sponsors, in compliance with current legislation.

The activities that form the scope of Access to Sources of Public Funding started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 13.

Figure 13 – Estimated time to perform this action



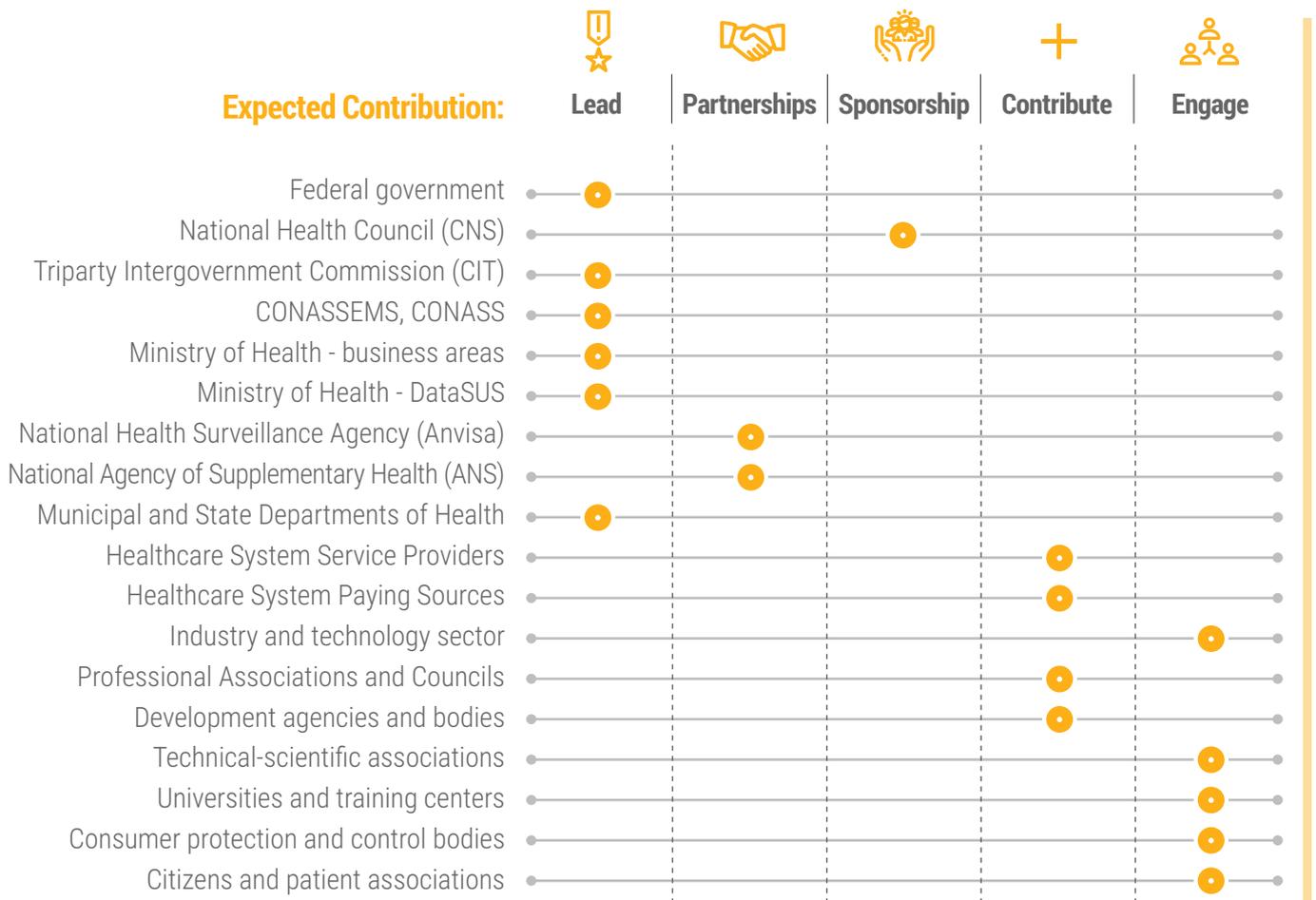
Source: own preparation.

EXPECTED BENEFITS:

- sources of stable public funds, allocated in a planned manner and in accordance with legislation and demands, enabling the execution of the proposed activities and the achievement of the Digital Health Vision.

EXPECTATION OF COOPERATION:

Figure 14 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

1.4.2 Establish mechanisms for private funding

The funding of the actions developed as part of the Strategy must be multilateral, focused on the objectives of Digital Health and aligned with the legal, regulatory and governance mechanisms of the Digital Health Strategy.

As in other areas of human activity, Digital Health can use mechanisms for sharing investment and operating costs, based on the use or provision of digital services. This arrangement, if properly aligned with national legislation and policies, should bring benefits to all stakeholders.

In particular, financing the collaborative space requires public and private investment, based on legal, ethical principles and clear rules, easy to understand and easy to apply.

This action aims to define and establish mechanisms, identify sources and find the appropriate means for the Digital Health Strategy to receive financial

resources from sources outside the public sector, respecting the legislation, so that the priorities are achieved.

The activities to be developed include:

- to identify legal and adequate private funding mechanisms for ESD28, especially for financing the Collaborative Space;
- to identify sources of private funding appropriate to the objectives of the ESD28, by profile and line of funding, as well as ways of obtaining these resources, in compliance with specific legislation;
- to plan the approach and prepare the legal documentation for obtaining these resources, mobilizing partners and sponsors.

The activities that form the scope of the Establishment of Private Funding Mechanisms are expected to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 15.

Figure 15 – Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- private funding of parts of the Digital Health Strategy actions is associated with the sector's commitment and is essential for the development of ESD.

EXPECTATION OF COOPERATION:

Figure 16 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

2



DIGITIZATION OF THE 3 LEVELS OF CARE

Induce the implementation of policies for the digitization of healthcare systems, accelerating the adoption of electronic health records and hospital management systems as an integral part of healthcare services and processes.

Priority 2: Computerization of the three levels of care

2.1 DIGITIZATION OF COUNTRY HEALTHCARE ESTABLISHMENTS

2.1.1 Perform the expansion of connectivity (internet)

*2.1.2 Expand the digitization
of Primary Care*

*2.1.3 Expand the digitization
of other levels of Care*

Priority 2: Digitization of the three levels of care

This priority reflects the need for digitization of healthcare services, accelerating the adoption of electronic health records and healthcare unit management systems, as an integral part of healthcare services and processes.

With this priority, we seek to face the challenge of providing healthcare services with information systems that make work more efficient and bring benefits to all who use them. It is necessary to minimize the effort of data collection, provide security, privacy and confidentiality of information and avoid retyping, which leads to the professional's waste of time and error due to inconsistent data.

The actions involved in this priority are organized into a single sub-priority:

- digitization of healthcare establishments in the country, whose challenges range from the need to align with state and municipal managers of public and private services, to adapt healthcare facilities and to the training of healthcare professionals who will be users of the new system.

The success of this initiative depends on the ability of the Ministry of Health to establish a governance model capable of supporting and monitoring implementation, by its ability to articulate, with different stakeholders, the availabil-

ity of the human, institutional, financial and legal resources necessary for the implementation throughout the national territory, as well as the availability and collaboration of the other stakeholders in the process.

This priority is directly related to the Conecte SUS Program, which consists of supporting digitization and exchanging information between healthcare establishments in the different healthcare services.

Expected benefits of this action for citizens and for the Brazilian healthcare system:

- improved service from access to healthcare information;
- greater reliability and security in patient information;
- more accurate diagnosis with agility in the search for patient's data and medical history;
- improvement in productivity, case resolution and system efficiency;
- combating fraud with greater transparency and citizen empowerment.

The actions mapped to make this priority feasible are described in the following subsections.

2.1 DIGITIZATION OF THE COUNTRY'S HEALTHCARE FACILITIES

This priority refers to the challenges of the digitization of healthcare facilities, which ranges from the need to align with state and municipal managers to adapt the healthcare facilities to the articulation for the training of healthcare professionals who will be the users of the new system.

2.1.1 Execute expansion of connectivity (internet)

This action seeks to enable internet access for healthcare facilities across the country. It includes partnerships and projects to overcome the difficulty of connecting healthcare facilities in Brazil. An initiative already underway is the partnership between the Ministry of Health and the Ministry of Science and Technology, driven by the need to fight Covid-19, in a project that aims to connect Family Healthcare Facilities (mapped by the Primary Healthcare Secretariat - SAPS), facilitating the collection and sharing of healthcare to citizens.

This initiative covers:

- strategy alignment with states and municipalities;
- establishment of an operational and communication flow;
- identification of obstacles, alternatives and fix actions;
- attraction and qualification assessment of potential suppliers.

It should be noted that, given the heterogeneity of the national territory, this action should consider different technologies for the stages of connectivity in the localities, which includes the use of optical fiber, satellite or radio to meet the specificities found in each part of the country.

The activities that form the scope of the Execution of the Expansion of Connectivity started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 17.

Figure 17 – Estimated time to perform this action



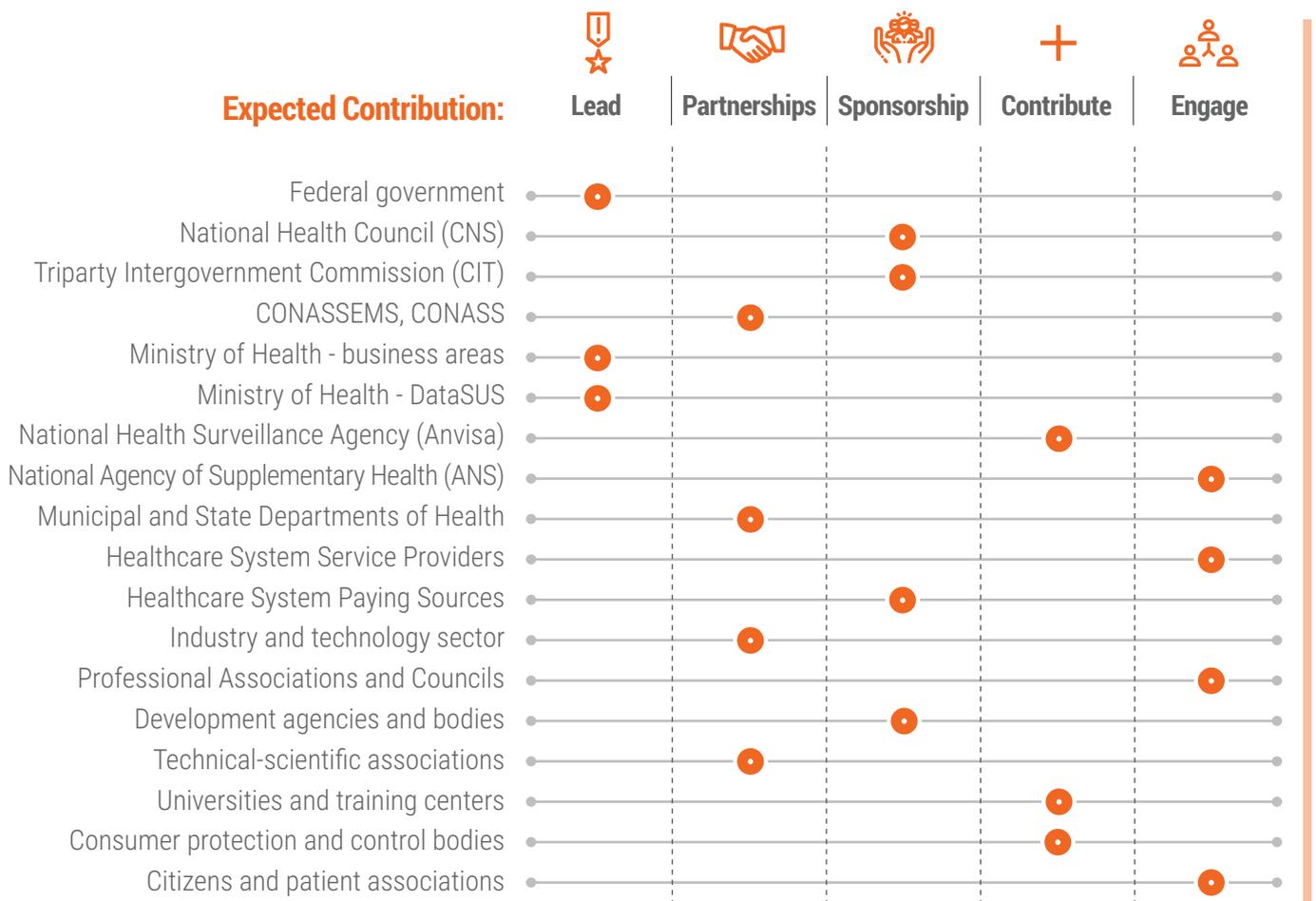
Source: own preparation.

EXPECTED BENEFITS:

- to bring internet to healthcare facilities;
- improved service through access to healthcare information;
- greater data security and strengthening continuity of care;
- strengthening the Government's capacity for action in formulating public policies.

EXPECTATION OF COOPERATION:

Figure 18 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

2.1.2 Expand Primary Care digitization

This action aims to computerize all healthcare facilities, the Family Health-care teams (eSF) and the Primary Health Care (eAP) teams in the country. The initiative called Support Program for the Digitization and Qualification of Primary Health Care Data – Informatiza APS is under development and will monitor the entire duration of the Conecte SUS program. This action was divided into three phases:

- definition of the support model for the Primary Care digitization;
- implementation in a pilot territory of the Support Model for the Digitization of Primary Care;
- expansion of the support model for the Digitization of Primary Care (in all Brazilian states and municipalities).

Among the main activities considered in the scope of this initiative, the articulation with CONASS and CONASEMS

stands out for agreeing roles and responsibilities of the Ministry of Health and the State and Municipal Departments of Health in the implementation, maintenance and continuous evolution of computerization and qualification of healthcare data of federated entities. It is noteworthy that this financing action is part of the Previne Brasil Program (BRAZIL, 2019b) and is considered one of the components (incentives for specific and strategic actions) to fund the new financing model for Primary Care. The state of Alagoas was chosen as a pilot and has additional funding resources to advance the provision of the infrastructure necessary for the installation of e-SUS-APS (electronic health record software provided by the Ministry of Health for Primary Care).

The activities that form the scope of the Expansion of the Computerization of Primary Care started in late 2019 and early 2020. The estimated time for prioritizing this action throughout the ESD is shown in Figure 19.

Figure 19 – Estimated time to perform this action



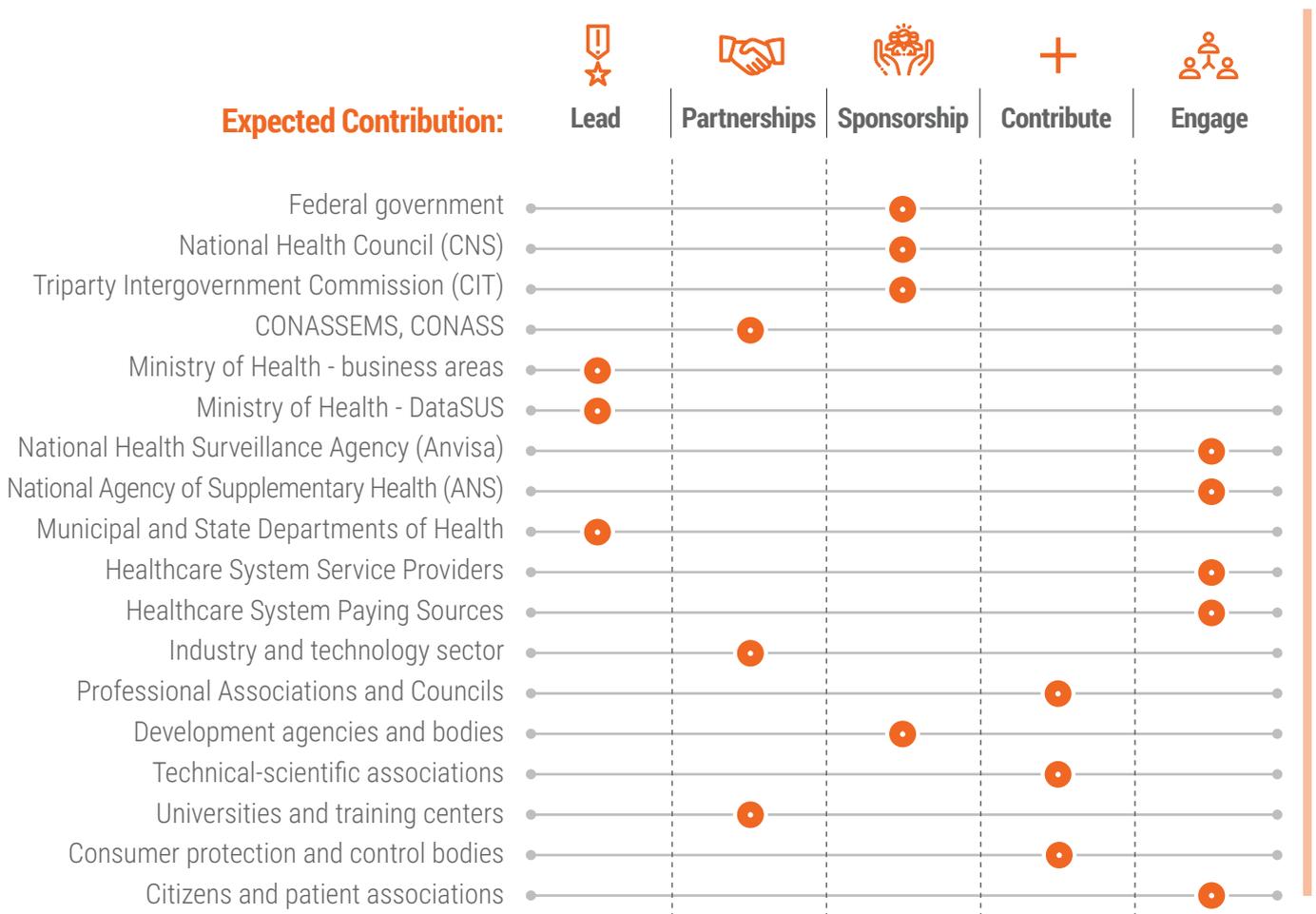
Source: own preparation.

EXPECTED BENEFITS:

- improved service from access to healthcare information;
- greater security and quality in the data collected and shared;
- strengthening the continuity of care based on reference and counter-reference;
- strengthening the Government's capacity for action in the formulation of public policies.

EXPECTATION OF COOPERATION:

Figure 20 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

2.1.3 Expand the digitization of other levels of Care

This action aims to computerize all Specialized and Hospital Care facilities in the national territory.

Computerization, that is, the adoption of information systems as an integral part of healthcare services and processes in the daily life of Care Facilities is a sine qua non condition to make Digital Health a core dimension of the Brazilian NHS (SUS). To carry out the full potential value of information in care and in the continuity of care, it is necessary that it be accessible, reliable and of quality. Therefore, this action must consider:

- articulation with the Ministry of Education and University Hospitals, CONASS, CONASEMS and the local management of healthcare facilities through computerization;

- availability of a healthcare facility Management System that can meet the needs for Specialized and Hospital Care;
- institution of a governance model of the adopted system and the way of funding maintenance activities;
- agreement on roles and responsibilities in the implementation, maintenance and continuous evolution of digitization, as well as in the qualification of the data collected and shared;
- establishment of minimum quality standards and a permanent assessment of the level of digital maturity of public or private healthcare facilities.

The activities that form the scope of the Expansion of Digitization of other Levels of Care started in 2020. The estimated time for prioritizing this action throughout the ESD is shown in Figure 21.

Figure 21 – Estimated time to perform this action



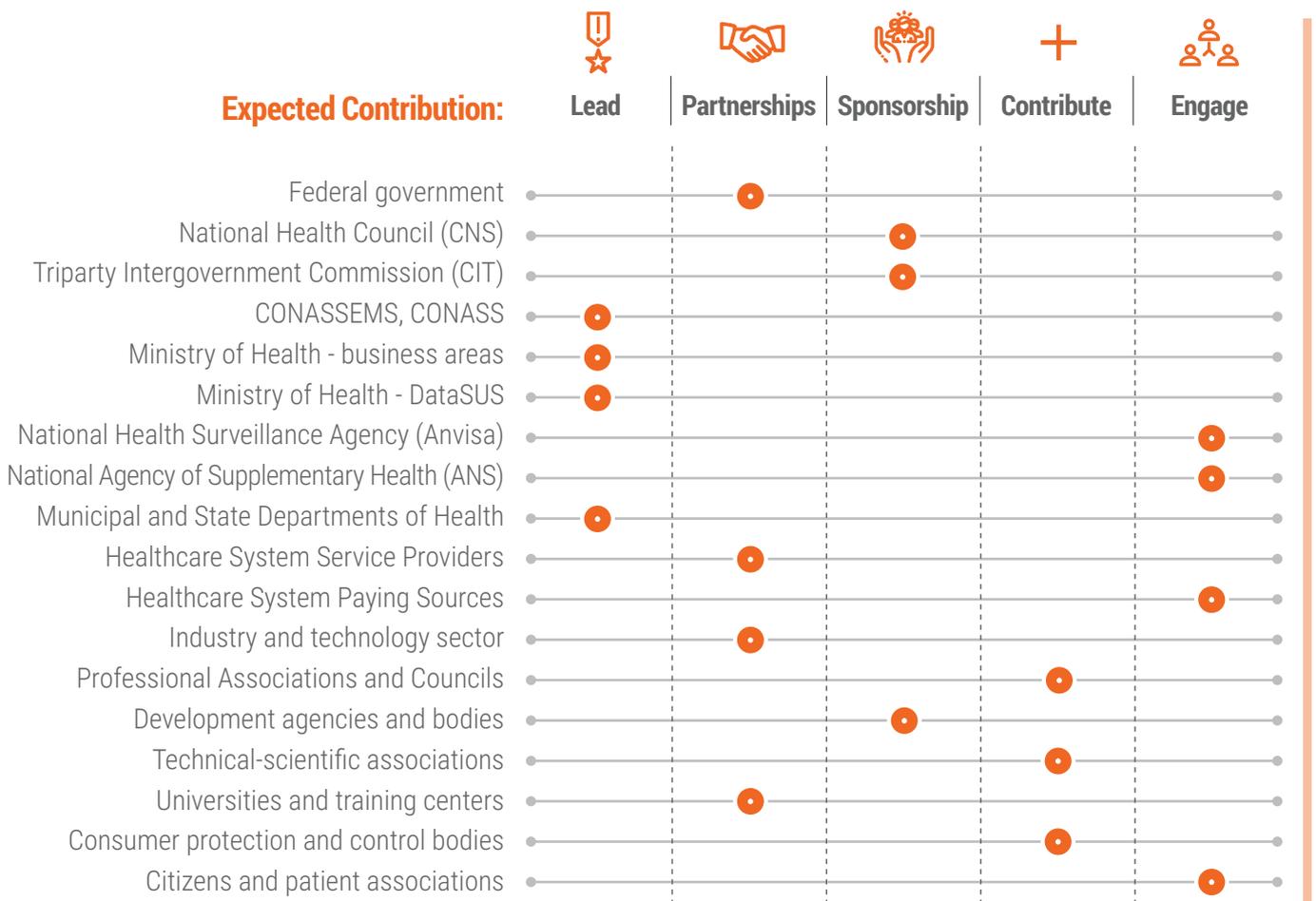
Source: own preparation.

EXPECTED BENEFITS:

- improved service from access to healthcare information;
- greater security and quality in the data collected and shared;
- strengthening the continuity of care based on referral information;
- strengthening the Government's capacity for action in the formulation of public policies.

EXPECTATION OF COOPERATION:

Figure 22 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

3



SUPPORT FOR IMPROVING HEALTHCARE

Make RNDS support the best clinical practices, through services, such as telehealth, and apps developed in MS and also other applications that are developed by the collaborative platform.

Priority 3: Support for improving healthcare

3.1 SUPPORT FOR CONTINUITY OF CARE AT ALL LEVELS

*3.1.1 Provide support to the care pathways
Provide support to the care pathways*

3.2 HEALTHCARE PROMOTION AND PREVENTION OF DISEASES AND INJURIES

*3.2.1 Ensure support for Healthcare Networks
(reference and counter-reference)*

3.2.2 Support Population Health Management

3.3 PROMOTING TELEHEALTH AND DIGITAL SERVICES

*3.3.1 Develop and expand telehealth and digital services
in the healthcare flow in the Brazilian NHS (SUS)*

Priority 3: Support for improving healthcare

This priority recognizes the need for RNDS to be the basis for improving care, by supporting the best clinical practices, using data, services and applications developed not only in the Ministry of Health but also those developed through the Collaboration Space.

In addition, this priority seeks to face the challenge of using information collected in different healthcare facilities, promoting the improvement of quality of care, productivity, resolution of care and efficiency in the management of the healthcare system.

The actions involved in this priority are organized into three sub-priorities:

- support for continuity of care at all levels, which covers the ability to explore, analyze and learn from the information available on RNDS to revisit the best practices in caring for the citizen, as well as understanding the determinants of care that ensure better resolution and efficiency for the healthcare system;
- healthcare promotion and disease prevention, which covers the capacity to develop innovative models in healthcare promotion and in the prevention of diseases and injuries based on information collected in different healthcare facilities or other sources of information that may be integrated to RNDS;

- promotion of telehealth and digital services, which covers the interoperability of information collected in healthcare facilities or remote assistance services, which ranges from the need for standardization of information, in order to allow a common language between different healthcare information systems, to the definition of rules and limits of sharing among the stakeholders involved.

The success of these initiatives depends on the ability of the Ministry of Health to attract public and private stakeholders, different spheres of government and the whole community in the construction of a new model of healthcare based on information.

Expected benefits of this action for citizens and for the Brazilian healthcare system:

- improvement in quality of care and access to care;
- strengthening evidence-based medicine;
- improvement in productivity, resolution and efficiency of the healthcare system;
- greater security in data and strengthening continuity of care;
- efficiency and intelligent distribution of resources from Healthcare Networks.

This priority is also subdivided, as we will see next.

3.1 SUPPORT FOR CONTINUITY OF CARE AT ALL LEVELS

It is the ability to explore, analyze and learn from the information available in the RNDS to revisit the best practices in caring for the citizen, as well as understanding the social and care determinants that ensure better resolution and efficiency for the healthcare system.

3.1.1 Provide support to the healthcare pathways

This action has the objective of allowing the information stored in the RNDS to assist in the evaluation and review of the care line protocols, as well as in the structuring of new lines.

RNDS, the national healthcare data integration platform, should be leveraged to provide healthcare information for Brazilian citizens so that healthcare managers can improve the management and quality of healthcare offered.

The action includes the creation of working groups to understand, based on the data available on RNDS, the “assistance paths” that achieve the best results.

It is in this sense that the objective of the expansion of Digital Health in the

country focuses on the use of information to refine actions and services that must be developed in the different points of care in the healthcare network, reviewing practices and improving resolution based on evidence that may be extracted from the RNDS.

Activities to be developed:

- articulation with municipal and state managers, as well as providers and payers of healthcare services, industry and universities to align roles and responsibilities;
- detailing of the scope of ambitions, limits, potential and challenges in the review of healthcare pathways and in the construction of safe and guaranteed assistance flows for the citizen;
- identification of the need for data and technological support to enable support for priority healthcare pathways.

The activities that form the scope of the Support Offer for Healthcare Pathways are scheduled to start in late 2022. The estimated time to perform this action throughout the ESD is shown in Figure 23.

Figure 23 — Estimated time to perform this action



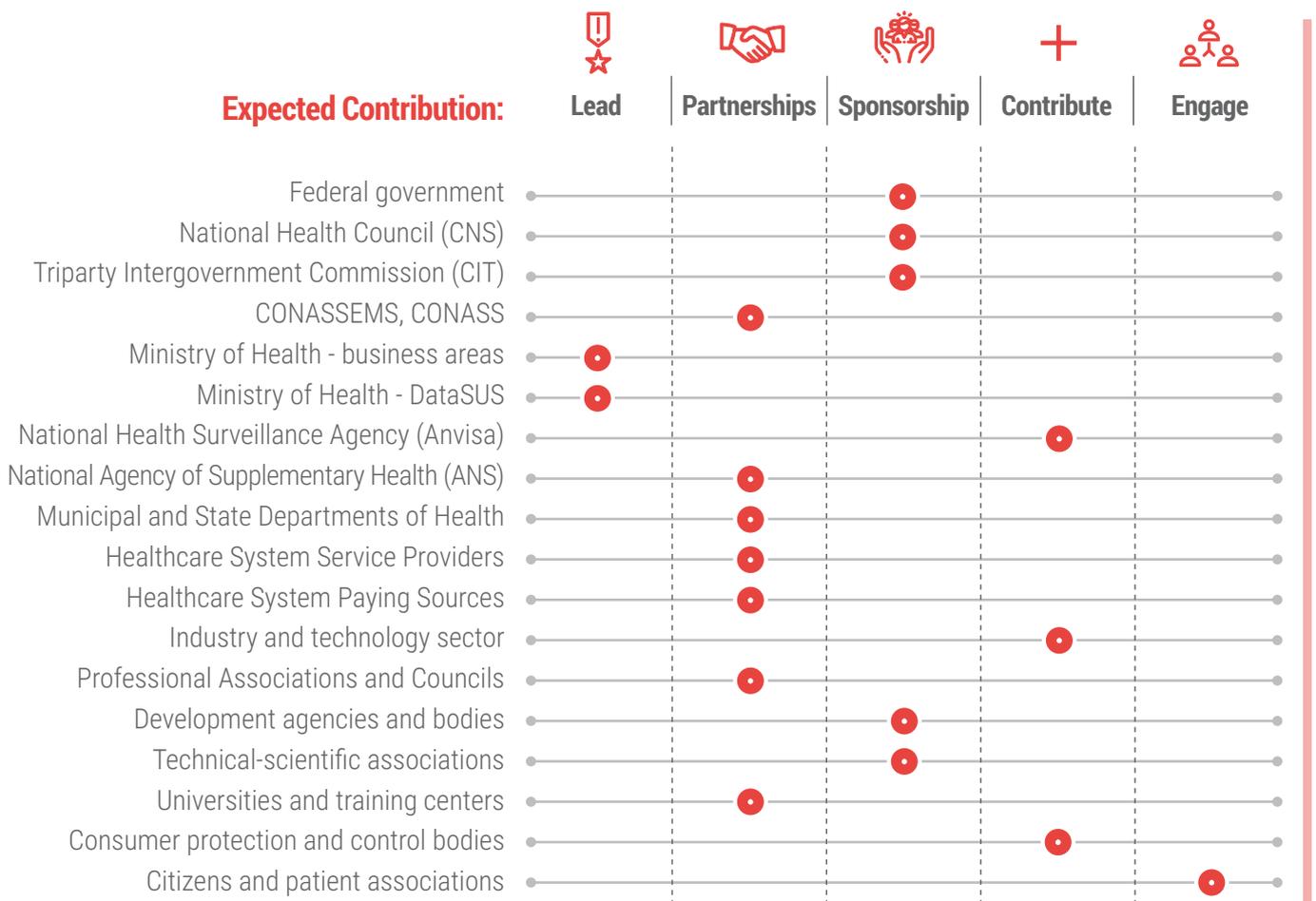
Source: own preparation.

EXPECTED BENEFITS:

- improved quality of care;
- strengthening of evidence-based medicine;
- efficiency, intelligent distribution and optimization of the use of network resources;
- strengthening of the Government’s capacity for action in the formulation of public policies.

EXPECTATION OF COOPERATION:

Figure 24 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

3.2 HEALTHCARE PROMOTION AND PREVENTION OF DISEASES AND INJURIES

It is the capacity to develop innovative models in healthcare promotion and disease prevention based on information collected in different healthcare facilities or other sources of information that may become part of the RNDS.

3.2.1 Guarantee support for Healthcare Networks (referral information)

This action aims to strengthen the Healthcare Networks (RAS) based on the management of the healthcare network based on information collected during the patient's journey.

The objective of establishing Healthcare Networks (RAS) is to promote the systemic integration of healthcare actions and services, as well as to increase the performance of the healthcare system. Digital Health and, more specifically, RNDS support this objective.

To achieve their full potential, RAS are guided by integrated care and population needs, principles that are only viable when supported by quality information,

capable of both understanding and coordinating the flow of care. The activities to be developed include:

- structuring mechanisms of monitoring and analysis of the potential use of RNDS in the evaluation of Healthcare Networks;
- integration of information to optimize multi-professional care as a fundamental component of comprehensive care;
- to seek, with the Regulation, the appropriate use of healthcare resources, data-driven, both in referral actions and in counter-reference, with conduct information and medical history that enable continuity of care and greater resolution of care;
- to identify data and technology support needs to achieve priority.

The activities that form the scope of Support to Healthcare Networks are scheduled to start in late 2020. The estimated time to perform this action throughout the ESD is shown in Figure 25.

Figure 25 — Estimated time to perform this action



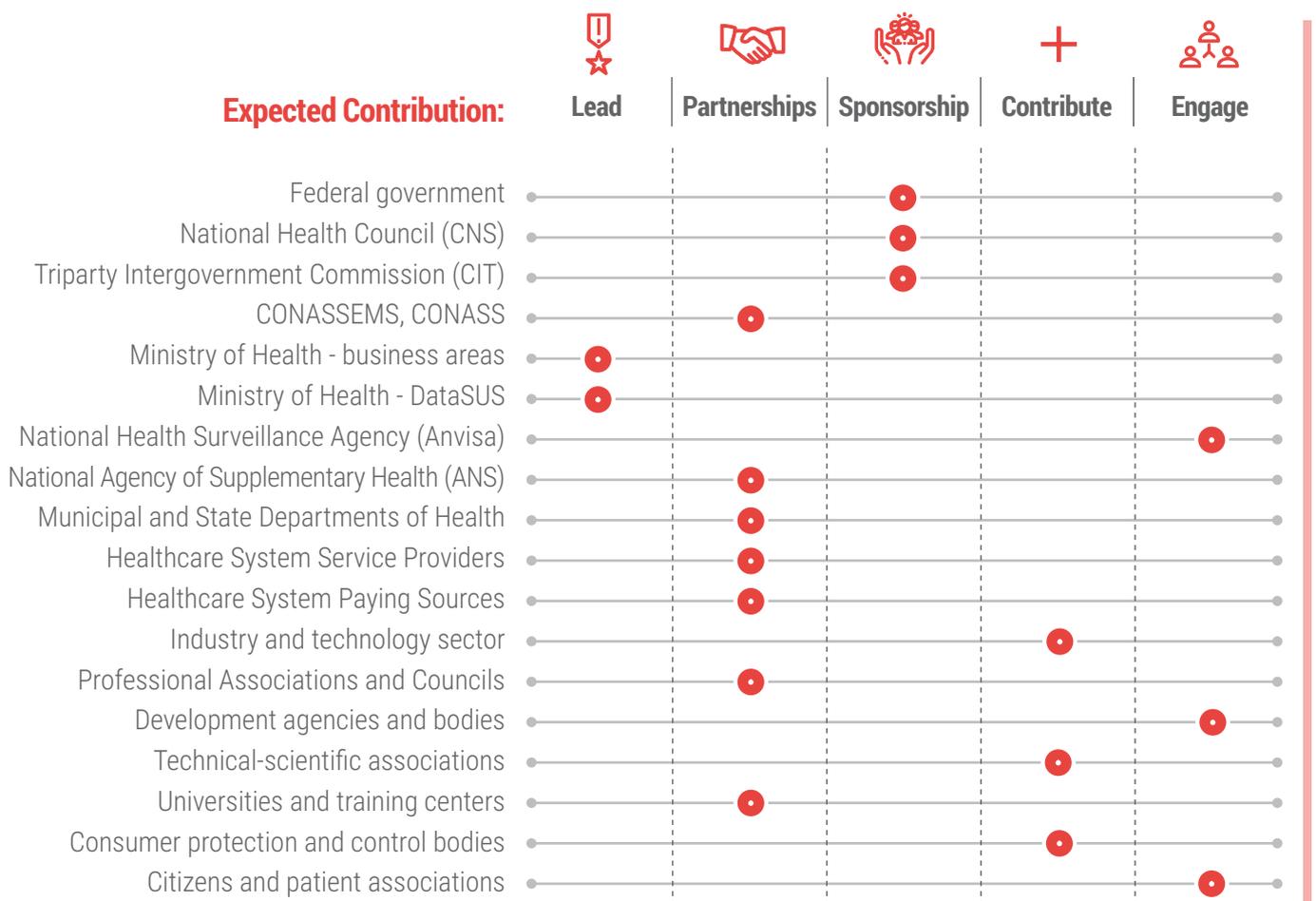
Source: own preparation.

EXPECTED BENEFITS:

- greater security and data quality;
- strengthening the continuity of care;
- greater reliability and security in patient information;
- improvement in productivity, case resolution and efficiency of healthcare system;
- greater efficiency in the distribution of resources from the healthcare service network.

EXPECTATION OF COOPERATION:

Figure 26 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

3.2.2 Supporting Population Health Management

This action aims to improve Population Health Management based on the collection, integration and handling of information, ensuring the correct stratification and the formulation of adequate healthcare policies and programs at the right time.

RNDS has the potential to allow a new way of acting in the promotion and protection of healthcare, in the prevention of diseases and injuries, in diagnosis, treatment, rehabilitation and maintenance of health of the individual and, consequently, of the population in which they are inserted.

The National Healthcare Data Network will allow the integration, accumulation and processing of clinical data from different sources, thus composing a large set of individualized information that should be used to understand the population and act on communities and individuals, with results that guide decision-making by managers, obviously respecting ethical criteria and legal precepts.

The purpose of this action is to transform the RNDS into an integrated information processing platform that will make it possible to decipher needs, identify opportunities and improve results for all involved.

This action includes the creation of mechanisms for the development of population segmentation models, of screening through the use of predictive intelligence and analysis, and also the construction of healthcare programs and appropriate engagement strategies for the different profiles of individuals, in line with the offer of coordinated care (right care, for the right person/community, in the right place at the right time).

Among the activities to be developed, the following stand out:

- to identify the different stakeholders and attract them to identify priorities, roles, responsibilities, expected results and goals for collective health;
- to identify the data and technological support necessary for the success of the action.

The activities that make up the scope of the Support Offer for Population Health Management are expected to start in late 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 27.

Figure 27 – Estimated time to perform this action



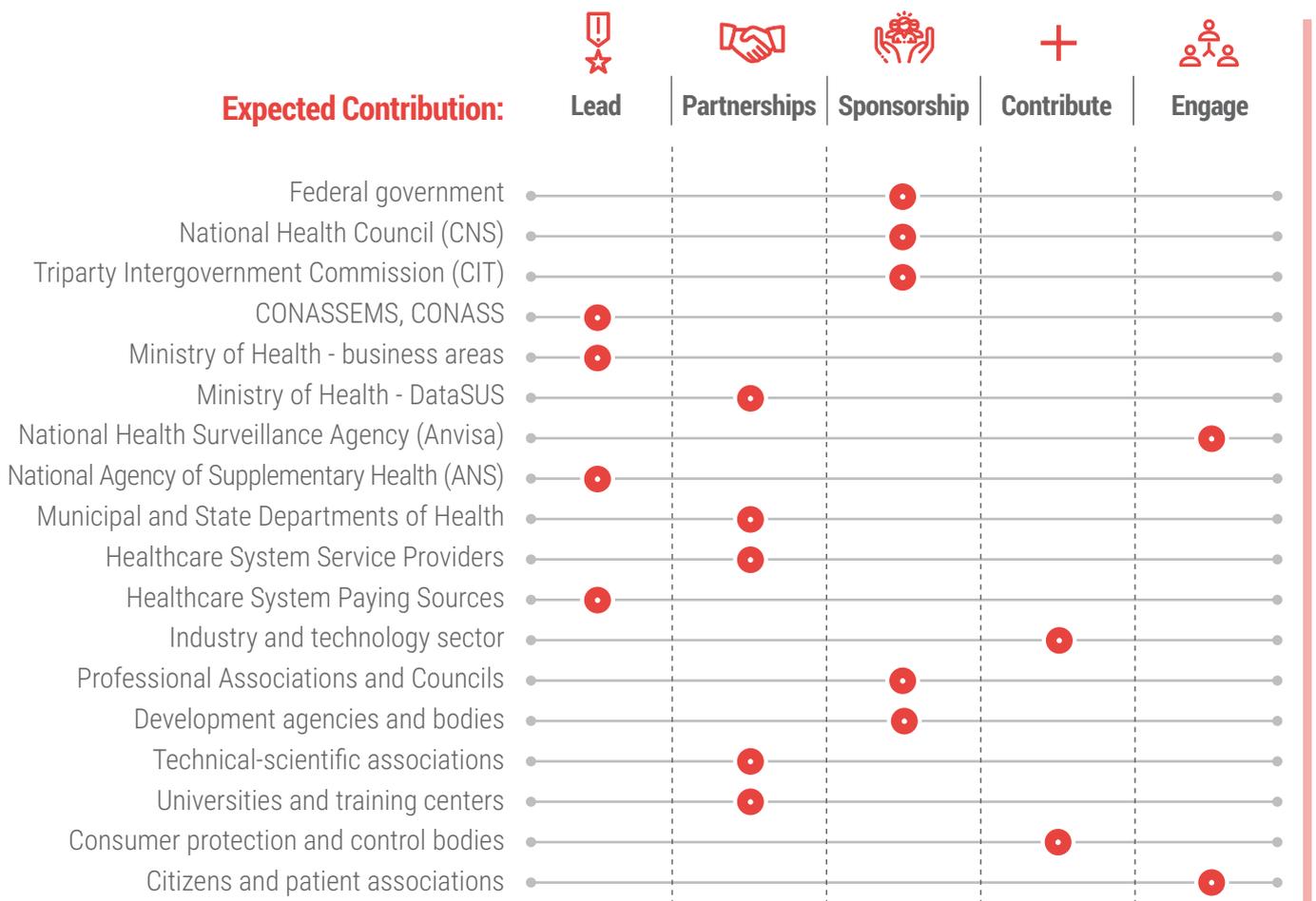
Source: own preparation.

EXPECTED BENEFITS:

- strengthening evidence-based medicine;
- more accurate diagnosis with agility in the search for subject's data and medical history;
- greater security in data and strengthening continuity of care;
- improvement in productivity, case resolution and system efficiency.

EXPECTATION OF COOPERATION:

Figure 28 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

3.3 PROMOTING TELEHEALTH AND DIGITAL SERVICES

It is the capacity for interoperability of information collected in healthcare facilities or remote assistance services, which ranges from the need for standardization of information, to allow common languages between different healthcare information systems, to the definition of rules and sharing limits between the stakeholders involved.

3.3.1 Developing and expanding telehealth and digital services in the Brazilian NHS (SUS) care flow

This action seeks to enable Telehealth to be integrated with healthcare services and processes, providing integrated care, safely, in different service locations.

Thus, this action presents as a challenge the expansion of telehealth services within the scope of the Brazilian NHS (SUS), in order to promote safe integrated care, in different places of care and levels of complexity, in the Healthcare Networks (RAS).

The development of the program requires practices that provide healthcare data that feed the National Healthcare Data Network (RNDS) and promote the improvement of healthcare. The activities to be developed include:

- to identify the various SUS stakeholders and managers, aiming to attract them to identify priorities, roles, responsibilities, expected results and goals for population health;
- to identify data and Healthcare Information and Communications Technologies (ICT) essential for remote care to be integrated with continuous care, at various levels of complexity within the scope of the Brazilian NHS (SUS), with a focus on addressing inequalities in access and use of healthcare services in SUS.

The action is based on the recognition of telehealth and telemedicine services as essential tools to promote care for patients in vulnerable situations and in unfavorable conditions, located in remote areas, with greater social and geographic dispersion, with the same effectiveness of care in large urban centers. In addition, the services are considered vectors of the articulation and interlocution of Primary Care with Specialized and Hospital Healthcare.

Little integration between the levels of complexity of telehealth offers and other types of assistance levels should be considered. This difficulty, however, is not particular to remote care, since the sharing of information between healthcare professionals, especially at different levels of care in the country, is still incipient due to the lack of expansion and/or implantation of ICT.

On the other hand, RNDS has the potential to establish guidelines and mechanisms in the path that each individual covers to obtain the integrality that they need.

The activities that form the scope of the Support Offer for Population Health Management are expected to start in late 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 29.

Figure 29 – Estimated time to perform this action



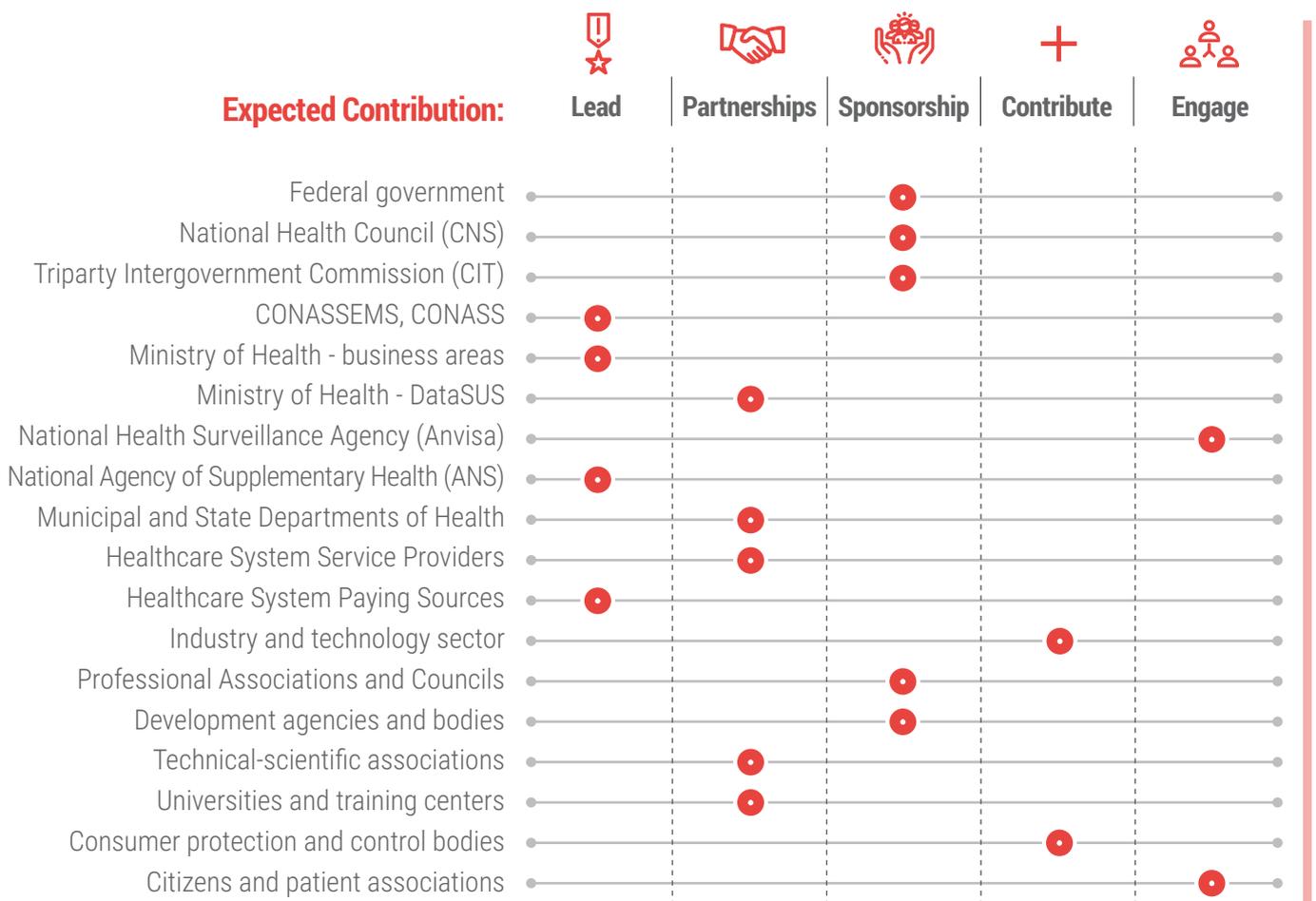
Source: own preparation.

EXPECTED BENEFITS:

- greater efficiency in the distribution of healthcare network resources;
- reduction in waiting time for specialized services;
- greater security in data and strengthening of continuity of care;
- improvement in quality of care and access to healthcare;

EXPECTATION OF COOPERATION:

Figure 30 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

4



THE USER AS A PROTAGONIST

Engagement of patients and citizens, to promote the adoption of healthy habits and the management of their health, their family and their community, in addition to assisting in the construction of the information systems they will use.

Priority 4: The Digital Health user as protagonist

4.1 USER ENGAGEMENT

4.1.1 Actions for citizen involvement

*4.1.2 Develop actions for the involvement
of healthcare professionals*

4.2 INFORMATION PLATFORMS FOR CITIZENS AND USERS

*4.2.1 Implement personal health
record services*

Priority 4: The Digital Health user as a protagonist

This priority represents the clear need for engagement of patients and citizens to promote the adoption of Digital Health for the management of their health, their family and their community, as well as support for the construction of the systems and services they will use.

The focus of this priority is to develop initiatives and approaches that allow users, citizens, healthcare professionals and managers to actively participate in the Collaborative Space and, thus, contribute to the prioritization of initiatives, definition of models of use and identification of priorities for the Digital Health.

This priority must not be seen only as governmental and must mobilize participants from the Collaboration Space to jointly explore experiences and models of involvement that result in effective co-creation, in a country characterized by enormous cultural, economic, educational and access diversity.

Expected benefits of this action for citizens and for the Brazilian health-care system:

- Digital Health models, services, applications and results originated from the needs of users and communities and, therefore, with better characteristics for mass compliance;
- empowered users, relatives, caregivers and community, protagonists and managers of their own health;
- better understanding of the mechanisms that lead to user engagement with best practices and treatments.

4.1 USER ENGAGEMENT

It has as its starting point the understanding that the Digital Health Strategy will only be successful if it is able to attract citizens, healthcare professionals and users of healthcare services who are active and participants in Digital Health. In other words, for the use of technologies and applications to be widely used, it is necessary for the Digital Health Strategy to develop the mechanisms for this to occur. It is known that engagement involves processes ranging from awareness to adoption and behavioral changes that have an impact, but the mechanisms that guarantee adherence or “viralization” are little known and explored. This priority seeks to develop such mechanisms, including co-creation mechanisms, as well as to reach a large number of users, professionals and managers.

4.1.1 Actions for engaging citizens

The purpose of this action is to develop mechanisms that attract citizens and their families, as well as user communities, to participate in Digital Health actions, to bring the focus and user needs to the ESD and to facilitate the development of Digital Health services and usage models that are widely used.

This action should mobilize the participants in the Collaborative Space to jointly explore experiences and models of involvement that result in more engaged communities, capable of promoting Digital Health and making it address users’ needs and desires.

The action should focus on initiatives for training citizens in Digital Health, among which can be mentioned:

- to develop an instructional video channel on the use of applications for citizens and examples of real life cases;
- to conduct webinars in partnership with the National Health Council, with an emphasis on the User Forum and other representatives of civil society, to present to Social Control the benefits of using digital health solutions;
- to develop and disseminate free distance education courses for citizens and offer them on the Government’s digital platforms;
- to carry out advertising campaigns to disseminate Digital Health actions to the citizen;
- to establish a specific flow and service at the SUS Ombudsman for Digital Health services.

The activities that form the scope of the Actions for the Involvement of Citizens are scheduled to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 31.

Figure 31 – Estimated time to perform this action



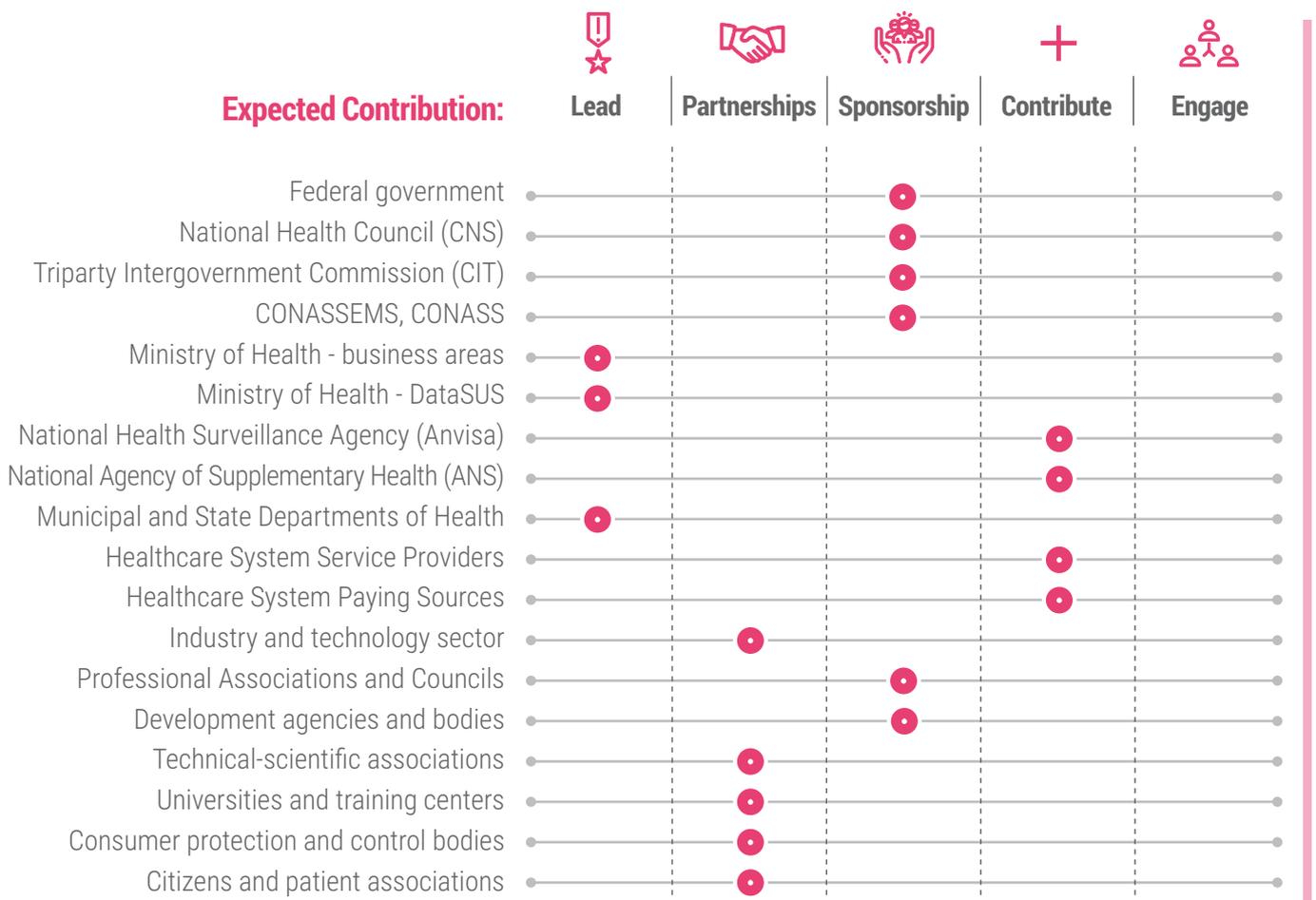
Source: own preparation.

EXPECTED BENEFITS:

- users, citizens and communities engaged in the use and promotion of Digital Health, leading to better systems and models, greater adherence to Digital Health, and more effective and efficient healthcare, as well as improving adherence to healthcare promotion and the prevention of diseases and injuries.

EXPECTATION OF COOPERATION:

Figure 32 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

4.1.2 Developing actions for the involvement of healthcare professionals

The objective of this action is to develop mechanisms that attract healthcare professionals and managers, individually or collectively, to participate in Digital Health actions, bringing the focus and needs of this class of users to the ESD and, thus, facilitating the development of Digital Health services and usage models that lead to widespread use.

Therefore, this action must mobilize the participants of the Collaboration Space for the joint exploration of experiences and models of involvement that result in engaged professional categories, capable of promoting Digital Health and making it incorporate the needs and ambitions of the healthcare professional and the manager.

For this action to be successful, it is necessary to attract associations of healthcare professionals and managers, class representatives, healthcare organizations, technology suppliers, universities, research centers and startups who are

interested and experienced in exploring aspects such as behavioral analysis, system usability, design thinking and engagement itself.

Activities to be carried out to achieve this priority include:

- to identify stakeholders with knowledge, experience and interest in the topic;
- to define a range of projects that are essential to obtain concrete results, but above all, allow to gain experience to advance this priority in a systematic way;
- to document and disseminate the accumulated knowledge and transform it into action.

The activities that form the scope of the development of Actions for the Involvement of Healthcare Professionals are expected to start at the end of 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 33.

Figure 33 – Estimated time to perform this action



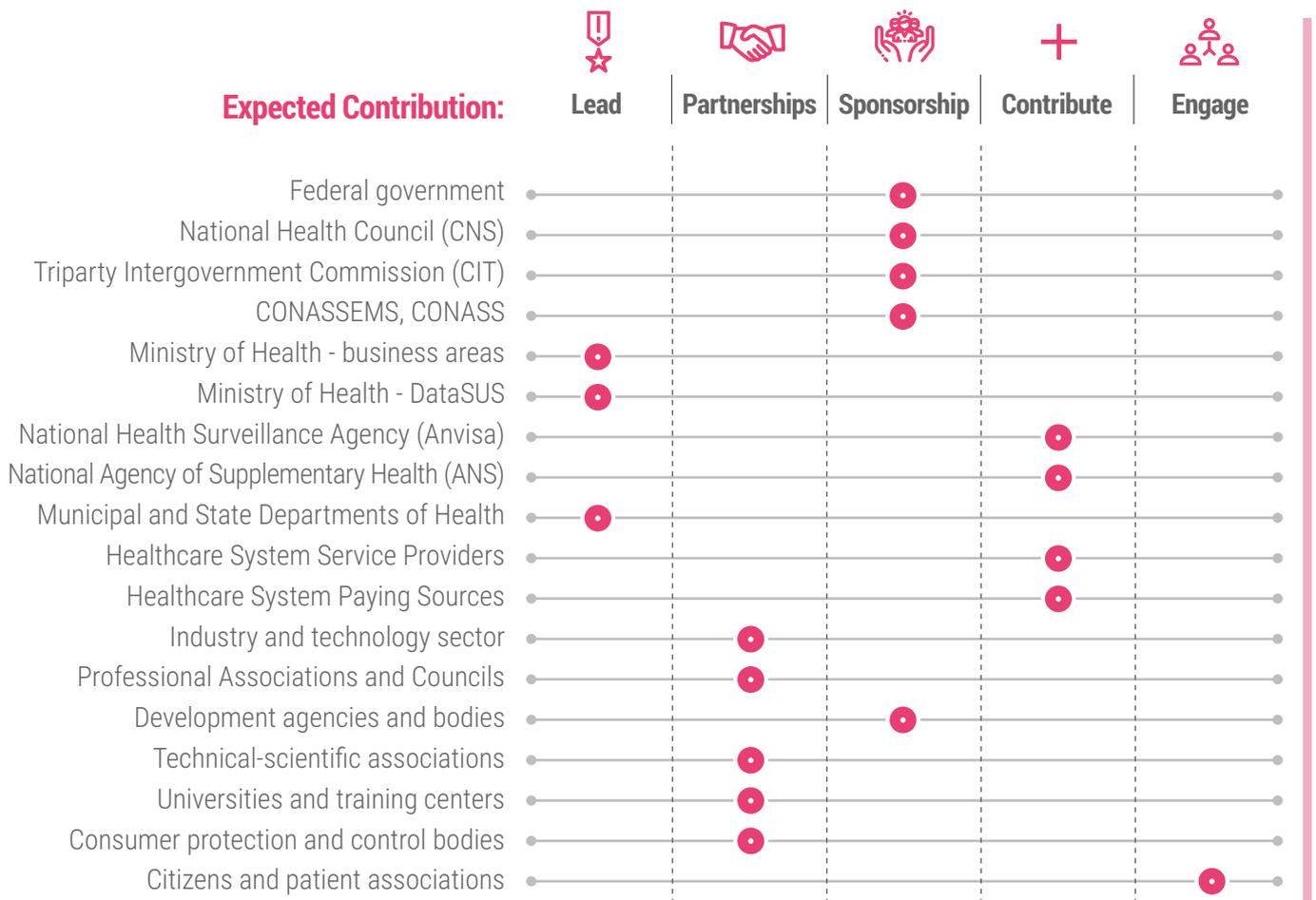
Source: own preparation.

EXPECTED BENEFITS:

- healthcare professionals and their associations engaged in the use and promotion of Digital Health, leading to better systems and models, which result in greater adherence and more effective and efficient healthcare.

EXPECTATION OF COOPERATION:

Figure 34 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

4.2 INFORMATION PLATFORMS FOR CITIZENS AND USERS

This priority aims to provide that healthcare information and knowledge, including good health practices, guidance for users, professionals and managers, be context-dependent, quality, evidence-based, timely and directed to the needs of users and healthcare system.

4.2.1 Implement personal health record services

This action aims to provide that healthcare information and knowledge, including good health practices, guidance for users, professionals and managers, be context-dependent, quality, evidence-based, timely and directed to the needs of users and healthcare system. It also aims to consolidate and expand the use of personal health record systems that are interoperable with other clinical information systems and encourage users, patients, their families and communities to understand, store, consult and use their healthcare data, making them take ownership of their information, become familiar with its use and, as a consequence, be managers of health and their community.

Thus, this action includes prospecting and implementing connectivity services with personal healthcare devices, such as cardiac monitors and blood glucose meters, among others.

Among the activities to be developed, the following stand out:

- to identify and analyze national and international experiences in the use of Personal Health Record systems, including their ability to interoperate with other systems, the use of accessible standards and technologies, costs and, above all, adherence to use;
- to establish technical, functional and usability requirements for the integration of these systems into the RNDS;
- to coordinate tasks for the design, development, validation, implementation and dissemination of the use of Personal Health Record applications, using the best practices identified and documented as part of this action.

The activities that form the scope of the development of Actions for the Involvement of Healthcare Professionals are expected to start in late 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 35.

Figure 35 – Estimated time to perform this action



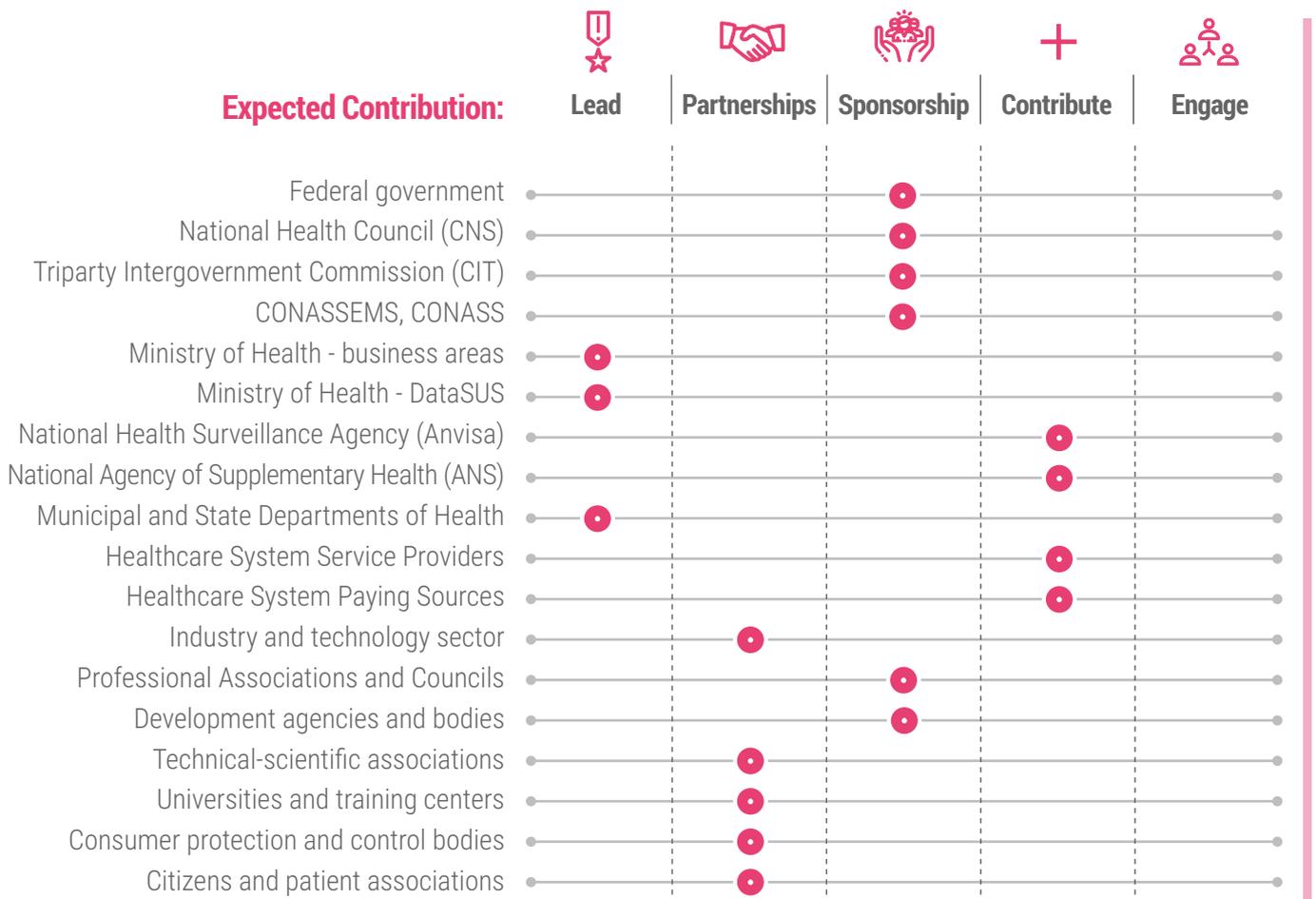
Source: own preparation.

EXPECTED BENEFITS:

- users and their communities more aware and attentive to their health conditions;
- users more engaged in treatments and prescriptions for maintaining their health;
- users and citizens more committed to the healthcare education process and with more autonomy for self-care;
- citizens who are multipliers in Digital Health in their communities.

EXPECTATION OF COOPERATION:

Figure 36 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

5



HUMAN RESOURCES TRAINING

Train healthcare professionals in Health Informatics and ensure the recognition of Health Informatics as a research area and Health Informatician as a profession.

**Priority 5:
Education and training of human
resources for Digital Health**

**5.1 TRAINING HEALTH
INFORMATICS PROFESSIONALS**

*5.1.1 Promote the training of Healthcare
professionals and managers*

5.1.2 Promote the training of IT professionals

**5.2 HUMAN CAPITAL APPRECIATION
IN DIGITAL HEALTH**

*5.2.1 Establish Health Informatics as a profession
and as an R&D area*

Priority 5: Education and training of human resources for Digital Health

This priority aims to provide the country with the appropriate number and profiles of professionals to achieve the proposed Digital Health Vision. It also seeks to move efforts so that the professional category of Health Informatician is created and that this area of knowledge is formally recognized by the research, development and teaching bodies.

Because it is an interdisciplinary and a multidisciplinary area, the success of Health Informatics initiatives, an essential foundation of Digital Health, requires that professionals in Health, Technology, Computing, Design, Education, Law and Management, among many others, work as a team in a coordinated and productive fashion. It is necessary to prepare professionals for different performance profiles, including reception, hosting, meeting, management, system development, identification of needs and requirements, process management, research and teaching.

The analyzed profiles must cover functions that only use digital services for specific purposes, such as healthcare and management professionals who use digital resources and have knowledge of analysis for decision making,

technicians, developers and information system implementers, in addition to professionals that perform management activities of Digital Health initiatives. Each profile requires a type of professional preparation, including competencies, knowledge, skills and attitudes, which can range from technological, use and suitability of use aspects to even those of strategy, financing, legislation and regulation.

Achieving this priority requires estimating the quantity, profile and availability of human resources in Health Informatics necessary for the success of the Digital Health Strategy, planning and executing actions that ensure that they are available and able at the expected times.

Expected benefits of this action for citizens and for the Brazilian health-care system:

- trained human resources, motivated and qualified to execute the actions of the Digital Health Strategy;
- better models, applications, solutions and use of Digital Health, leading to better adherence, better service and greater management capacity of the Digital Health Strategy.

5.1 TRAINING HEALTH INFORMATICS PROFESSIONALS

This subpriority covers the need to provide professionals with adequate knowledge, experience, attitudes and culture, in number, profile and training sufficient to achieve and sustain the Digital Health Vision. Training efforts should be guided by the analysis of professional profiles and the volume of professionals by profiles and competencies, knowledge and skills required for each profile identified.

5.1.1 Promoting the training of Healthcare professionals and managers

The training of healthcare professionals and managers is essential to enable Digital Health services and applications to be used and explored in all their dimensions, as instruments to support clinical practice, clinical and administrative management, collaboration, analysis and generation of insights.

These professionals must be prepared to be leaders in the development of the Digital Health Strategy. For this to happen, it is necessary to identify the training and qualification needs, formal and informal, of professionals and managers in disciplines such as Introduction to Health Informatics; The Trajectory of Digital Health in Brazil; National Health Data Network; Safety and Ethics in Data Sharing; Data, information and knowledge: data quality to generate information and knowledge; Data analysis; Health Information Systems; Conecte SUS Program – scope and objectives; Good Health System Implementation Practices; General Data Protection Law (LGPD); and Health Informatics Assessment Indicators.

Activities to be carried out as part of this action include:

- to bring together and articulate the diverse and relevant stakeholders that develop efforts to train professionals for Health Informatics;
- to survey and describe competencies, experiences, knowledge and skills associated with each functional profile necessary for health professionals and managers to be active participants in the Digital Health Strategy;
- to identify the volume of professionals to be trained, by profile, in order to measure the demand for education and training;
- to prepare and execute a Training Plan to achieve the proposed objectives, including graduation, specialization, master's and doctorate efforts.

The activities that form the scope of the action for the Training of Health Managers started in 2020. The estimated time for carrying out this action throughout the ESD is shown in Figure 37.

Figure 37 – Estimated time to perform this action



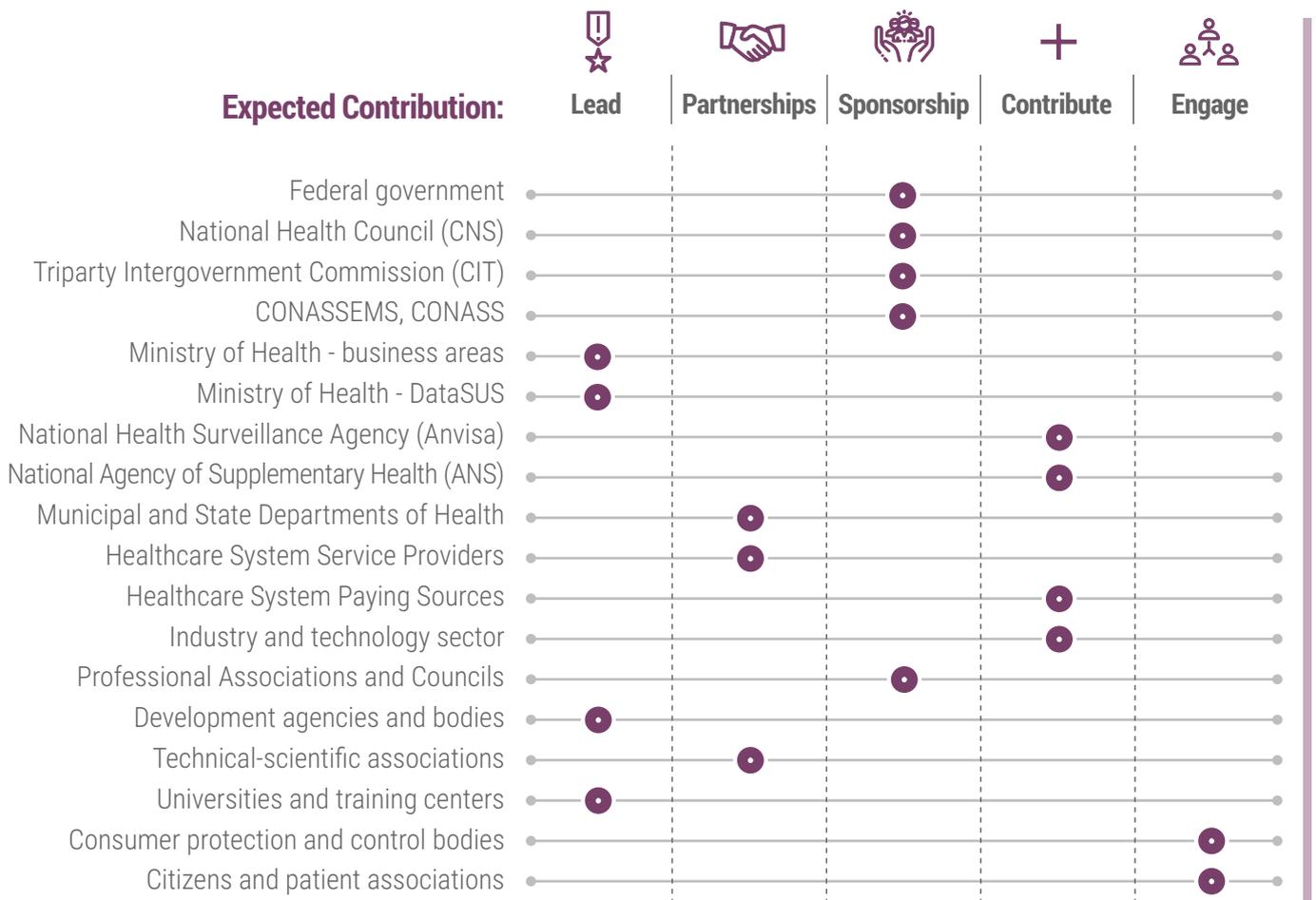
Source: own preparation.

EXPECTED BENEFITS:

- healthcare professionals and managers in adequate number and profile, with the knowledge, experience and attitudes necessary to be agents of the implantation and implementation of the Digital Health Strategy.

EXPECTATION OF COOPERATION:

Figure 38 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

5.1.2 Promoting the training of IT professionals

The training of Digital Health Information and Communications Technology Professionals is essential for them to be agents of the implantation and consolidation of Digital Health in all its dimensions, such as support to clinical practice, management, collaboration, knowledge generation. ICT professionals must be prepared to be leaders in the implementation and use of services based on Digital Health. For this to happen, it is necessary to identify the training and qualification needs, formal and informal, of these professionals in interdisciplinary topics, such as Health Informatics; Healthcare data characteristics; Health Information Systems; Conecte SUS Program; Clinical data representation patterns and models; General Data Protection Law (LGPD) and Security, Ethics, Privacy and Confidentiality Standards; Health Informatics Performance Indicators; and Use of secondary healthcare data.

Activities to be carried out as part of this action include:

- to bring together and articulate the diverse and relevant stakeholders that develop professional training processes for Health Informatics;
- to survey and describe competencies, experiences, knowledge and skills associated with each functional profile necessary for IT professionals to be active participants in the Digital Health Strategy;
- to identify the volume of professionals to be trained, by profile, in order to measure the demand for education and training;
- to prepare and execute a Training Plan to achieve the proposed objectives, including graduation, specialization, master's and doctorate efforts.

The activities that form the scope of the Training for Information Technology Professionals action started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 39.

Figure 39 – Estimated time to perform this action



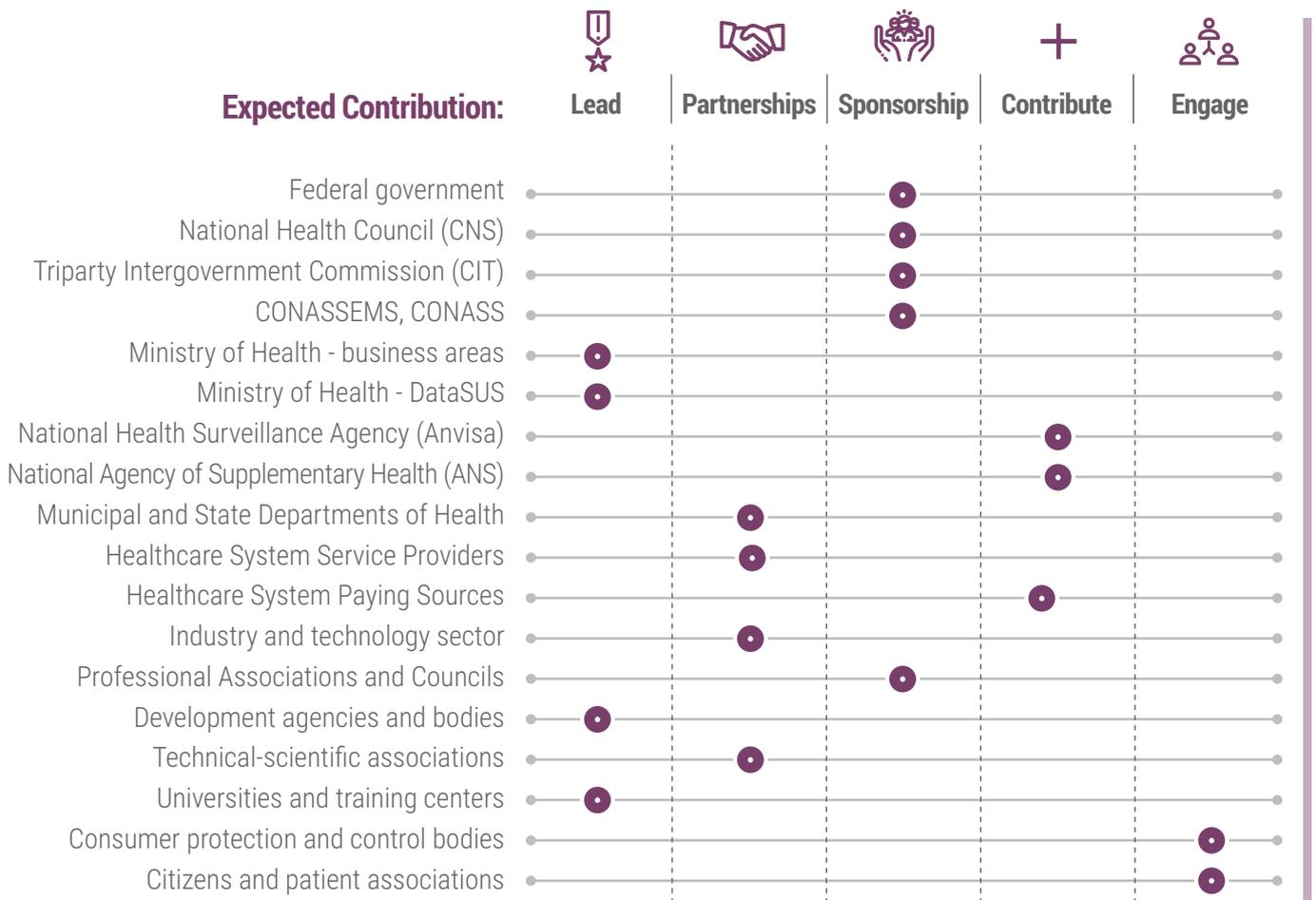
Source: own preparation.

EXPECTED BENEFITS:

- Information and Communications Technology professionals in sufficient numbers and with an adequate profile, with the knowledge, experience and attitudes necessary for them to be agents of the implementation of the Digital Health Strategy.

EXPECTATION OF COOPERATION:

Figure 40 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

5.2 HUMAN CAPITAL APPRECIATION IN DIGITAL HEALTH

Although Health Informatics has a significant expression in the world and there are scientific societies in Brazil dedicated to the area, as well as numerous research centers and universities with formal Undergraduate and Postgraduate courses in Health Informatics, the area lacks formal recognition as a profession and also as an area of scientific and technological research and development.

Achieving this priority means obtaining the recognition of the profession of Health Informatician, with the inclusion of the profession in the Brazilian Classification of Occupations (CBO) and with certification by research promotion agencies (such as Fapesp, Finep and CNPq) of Health Informatics as a specific multidisciplinary area.

5.2.1 Establishing health informatics as a profession and as an R&D area

The production of science of expressive quality and quantity in Digital Health, as well as the consolidation of knowledge and the dissemination of successful cases are essential foundations for achieving and maintaining the proposed Digital Health Vision. In this sense, the appreciation of Health Informatics as a research and development area recognized by the National Council for Scientific and Technological Development (CNPq) is an important step towards advancing Digital Health.

Another fundamental advance for the building of human capital for Digital Health is the regulation of the Health Informatician profession, which, despite being certified by technical-scientific associations, does not have the official government regulation and is not included in the Brazilian Classification of Occupations (CBO).

The appreciation of human capital in Digital Health should allow recognition by government agencies and, consequently, the opening of specific public tenders or even the offer of research funding and the granting of scholarships for this occupation area.

Among the activities to be developed, the following stand out:

- to attract public and private organizations to define strategies and approaches to regulate Digital Health as a research area;
- to structure instruments of mobilization and convincing to conduct discussions about the relevance to the national public interest;
- to promote the recognition of health informatics as a formal acknowledged profession in Brazil at CBO, which includes the definition of professional profiles and details of their responsibilities, duties and ethical limits.

The activities that form the scope of the Actions for the Appreciation of Human Capital in Digital Health are expected to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 41.

Figure 41 – Estimated time to perform this action



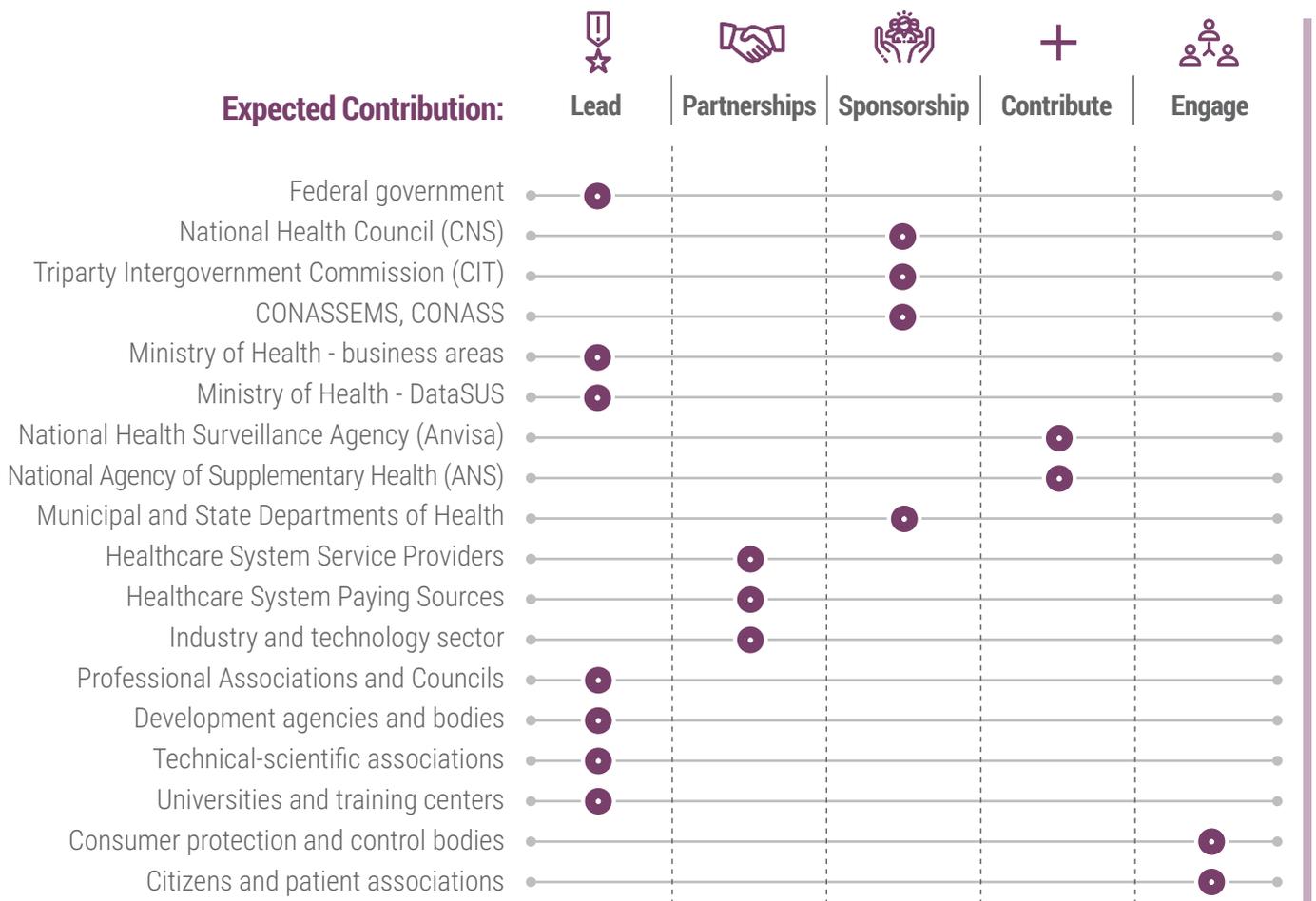
Source: own preparation.

EXPECTED BENEFITS:

- regulation that will allow the development of careers that add to the public interest;
- greater recognition and facilitation to attract professionals to the area of knowledge and the profession;
- stimulus to qualification and consequent narrowing of professional filling gaps.

EXPECTATION OF COOPERATION:

Figure 42 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6



INTERCONNECTIVITY ECOSYSTEM

Allow the National Healthcare Data Network to enhance collaborative work in all health sectors so that technology, concepts, standards, service models, policies and regulations are put into practice.

Priority 6: Interconnectivity Ecosystem

6.1 INTEROPERABILITY WITH EXTERNAL SYSTEMS

6.1.1 Promote interoperability with Primary Care

6.1.2 Promote interoperability with laboratories

6.1.3 Promote interoperability between levels of Care

6.1.4 Promote interoperability with pharmacy services

6.1.5 Promote interoperability with telehealth services

6.1.6 Implement outpatient regulation services

6.2 STANDARDS AND TERMINOLOGIES

6.2.1 Strengthen the Health Terminology Repository (RTS)

6.2.2 Develop standards for Health information

Priority 6: Interconnectivity ecosystem

The Health Interconnectivity Ecosystem is the priority that, once reached, will enable the results of the collaboration to be put into practice in all sectors of Healthcare, contributing to achieve the Strategic Vision targeted by this Action Plan.

The Health Interconnectivity Ecosystem will use the standards and services available at the RNDS, in which concepts, technologies, standards, service models, policies, regulations, practices and cultures that will enable Digital Health services among all stakeholders and sectors will be implemented.

As is the case today with the provision of online services for the various areas of human activity, such as the sale of services or goods, it should be possible to carry out Health transactions between the stakeholders in various sectors. But for this to be possible, technology alone is not enough.

The construction of RNDS as a national online platform for healthcare services and information requires that all pillars of Digital Health be explored and developed. Brazil has the essential components for Digital Health, described in the e-Health Strategy for Brazil, such as the unique identifiers for citizens, patients, healthcare facilities, healthcare professionals and healthcare insurance plans, which allow RNDS to position itself to be the digital platform for information and services for Health, for the Brazilian NHS (SUS) and for all Brazil. The benefits brought by an online platform like this will be numerous for all healthcare stakeholders in the public and private sectors.

The Health Interconnectivity Ecosystem must be developed in phases that bring progressive results and that allow the accumulation of benefits and knowledge that justify and motivate the execution of the next phases.

Expected benefits of this action for citizens and for the Brazilian healthcare system:

- public and private telemedicine and telehealth services, offered via RNDS, bringing agility in the reports, quick access

to specialists, expansion in the service capacity, accessibility, user satisfaction, cost reduction and possibility of choice for the user and for the requesting professional;

- Healthcare access management service, including access management of telehealth, without regional access restrictions;
- alert services for drug interaction, offered by interaction consultation or by a set of patients or beds;
- integrated chronic patient monitoring services for multiple healthcare insurance plans;
- services that integrate multiple organizations for scheduling appointments and exams;
- knowledge extraction services for improving diagnosis and evaluation of therapies;
- alert systems to identify potential epidemic outbreaks.

The Health Interconnectivity Ecosystem must be developed in phases that bring progressive results and that allow the accumulation of benefits and knowledge that justify and motivate the execution of the next phases.

The subdivisions of this priority are presented below.

6.1 INTEROPERABILITY WITH EXTERNAL SYSTEMS

Prioritizing the development of services that promote interoperability between information systems in all sectors of Health is essential to achieve the objectives of RNDS as a national online platform for healthcare services. This priority must be developed in alignment with Priority 1, with healthcare stakeholders from all sectors.

6.1.1 Promoting interoperability with Primary Care

This action aims to offer mechanisms and develop practices and experiences of syntactic, semantic, operational and organizational interoperability so that information systems interoperate with Primary Health Care, not only in the public sector, but also in the emerging Primary Care in Private Health Insurance.

RNDS must enable the interoperability of Electronic Patient Record Systems at all levels of Care, understanding Primary Health Care as a fundamental and ordering element of care. In association with other initiatives that are part of the ESD, such as the integration with Specialized and Hospital Care, it is expected that Primary Care support systems, open to in-

teroperability, will result in a stimulus for Primary Health Care practices – already consolidated in the Brazilian NHS (SUS) – to be absorbed and expanded by Private Health Insurance for the benefit of the entire Brazilian healthcare system.

Among the activities to be developed to achieve this priority, the following stand out:

- to attract software and service companies, public healthcare and private health insurance organizations, with experience and knowledge in Information Systems for Primary Care;
- to establish, exercise and publish standards for description, exchange, storage and access to healthcare information, with a primary focus on Primary Care;
- to systematically evaluate the results obtained and disseminate them to produce knowledge and attract new stakeholders.

The activities that form the scope of the Interoperability with External Systems action started in 2020. The estimated time to perform this action is illustrated in Figure 43.

Figure 43 – Estimated time to perform this action



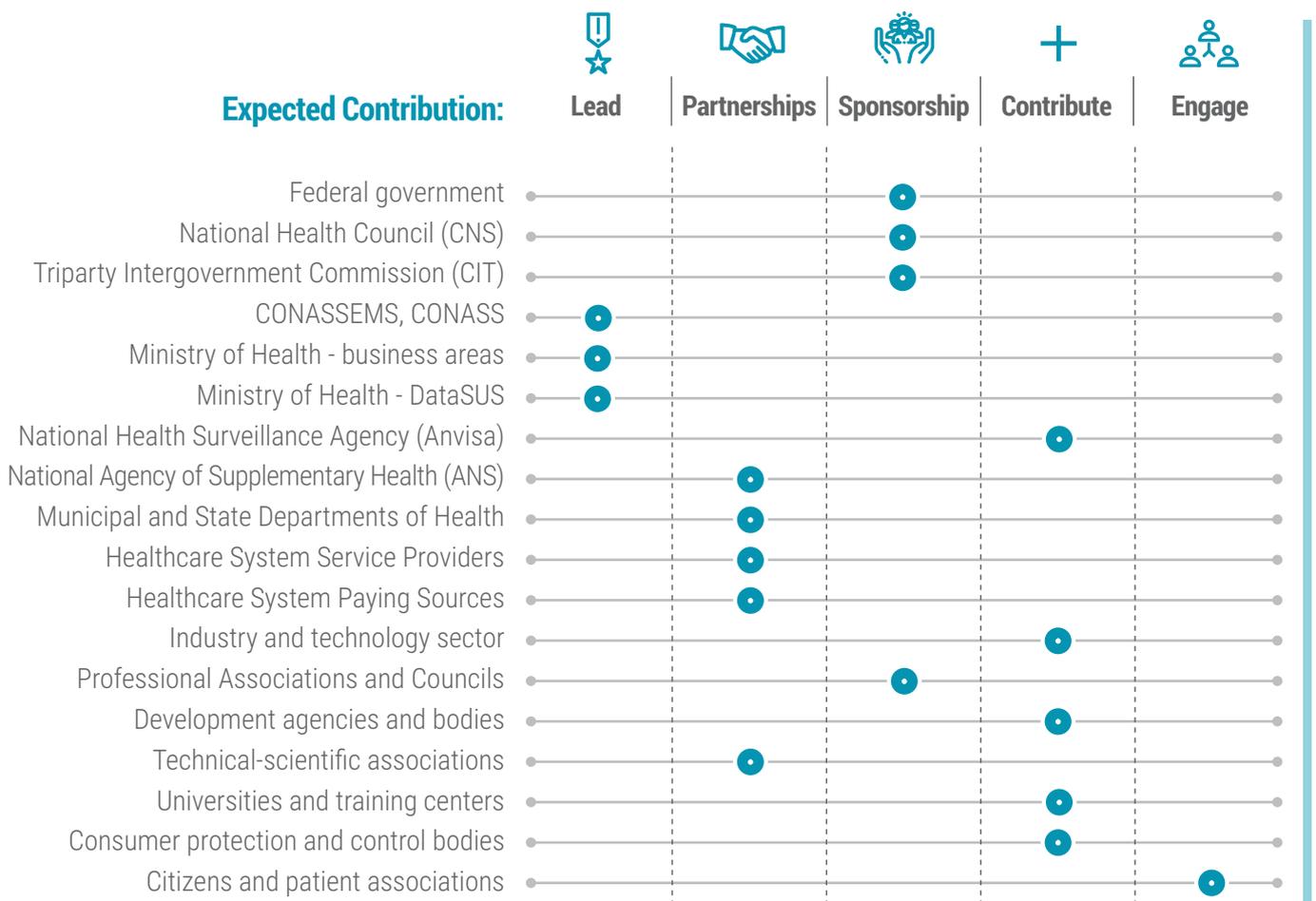
Source: own preparation.

EXPECTED BENEFITS:

- informational and operational support for strengthening Primary Healthcare, contributing to its greater integration;
- stimulating the expansion of Primary Care in Private Health Insurance.

EXPECTATION OF COOPERATION:

Figure 44 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.1.2 Promoting interoperability with laboratories

Enabling public and private laboratories to send Covid-19 test results to RNDS is an essential step that has already been taken in the direction of developing a set of solutions for interoperability between public and private Healthcare information systems. This action, which proved to be relevant during the pandemic, opens the door for new features and services to be offered through RNDS after the pandemic outbreak, including the exchange of results from all types of laboratory tests, ethically, under the control of citizens and for the benefit of Healthcare.

In addition to collecting these data and test results, the platform will process and make them available, securely and with privacy assurance, for professionals, managers and citizens, through the Conecte SUS Portal.

This is an important initiative in the set of solutions developed by DataSUS for fighting the new coronavirus and for

interoperability between public and private Healthcare information systems.

Among the activities to be developed to expand this initiative and achieve the proposed priority, the following are worth mentioning:

- to establish the set of laboratory tests essential for Primary Healthcare, including Health Surveillance;
- to establish, exercise, validate and publish rules, usage criteria, models and standards that will allow interoperability between these systems for the purposes of laboratory tests;
- to evaluate the results obtained for each cycle and establish the expansion plan.

The activities that form the scope of the action to Promote Interoperability with Laboratories started in 2020. The estimated time for carrying out this action throughout the ESD is shown in Figure 45.

Figure 45 – Estimated time to perform this action



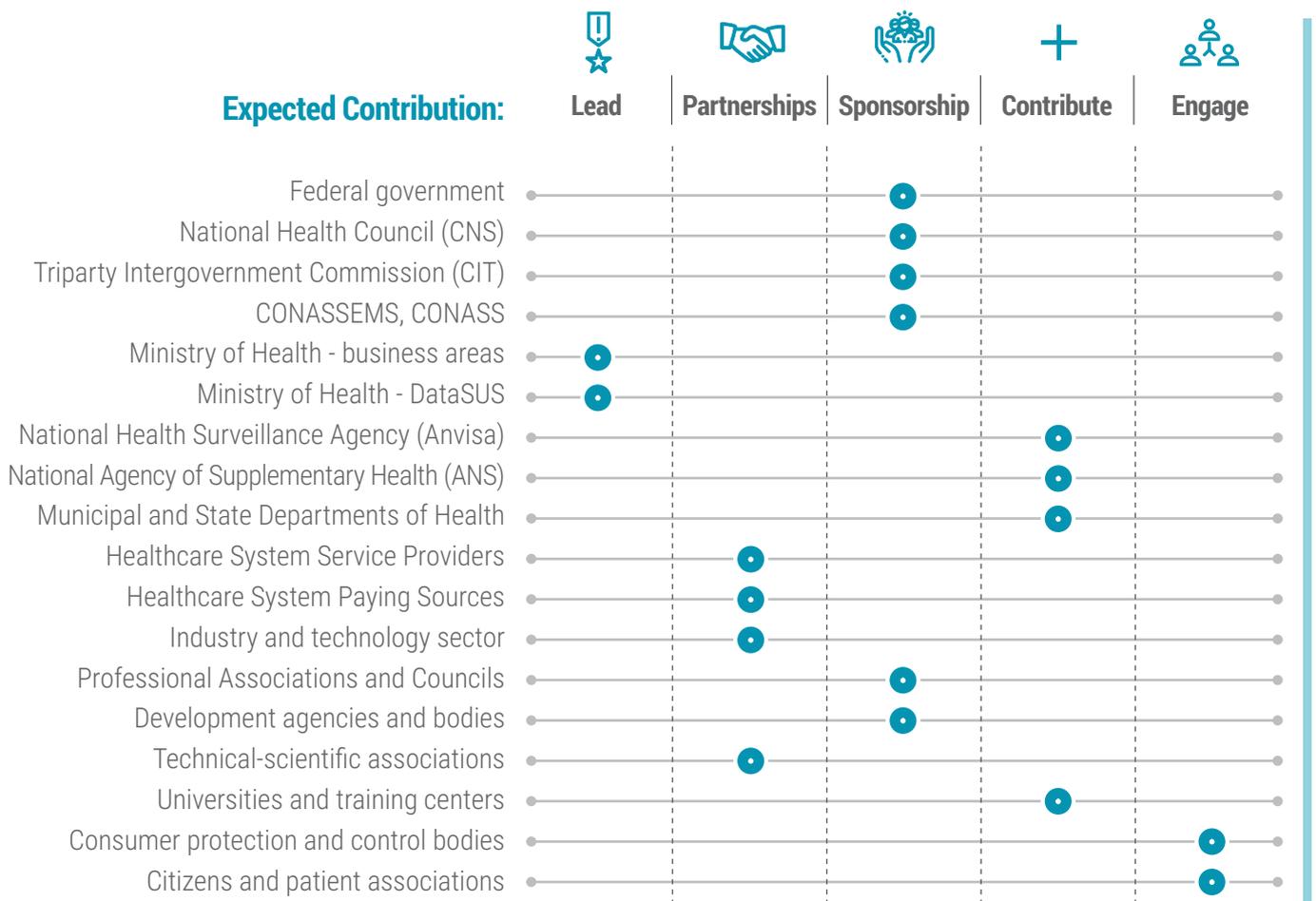
Source: own preparation.

EXPECTED BENEFITS:

- better monitoring of the user’s health, allowing an integrated view of their medical history;
- better continuity of care and support for the referral information model;
- better management of the population’s health and epidemiological outbreaks, thanks to quality information, individualized and independent of the source.

EXPECTATION OF COOPERATION:

Figure 46 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.1.3 Promoting interoperability between levels of care

This action aims to offer mechanisms and develop syntactic, semantic, operational and organizational interoperability practices and experiences so that information systems used in the three levels of care interoperate with each other, not only within the public sector, but also within private healthcare and private health insurance.

The continuity of Care and Integrated Health Management, both from a clinical and administrative point of view, requires that information flow between levels of care, following the patient and enabling the monitoring of treatment, offering clinical protocols, definition of conducts and support to referrals. The interoperability between Primary Care, Medium and High Complexity is also essential for the regulation systems of Healthcare to be effective and support the reference and counter-reference models.

From the point of view of Healthcare management, interoperability between the three levels of care allows an integrated view of morbidity and mortality studies. For this interoperability between the levels of care to advance, the following activities must be developed:

- to establish the essential needs for data flow between levels of care, according to the perspective of each of the relevant stakeholders, from the user of healthcare services to paying sources;
- to establish, exercise, validate and publish rules, usage criteria, models and standards for interoperability between levels of care.

The activities that form the scope of the action to Promote Interoperability between Levels of Care started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 47.

Figure 47 – Estimated time to perform this action



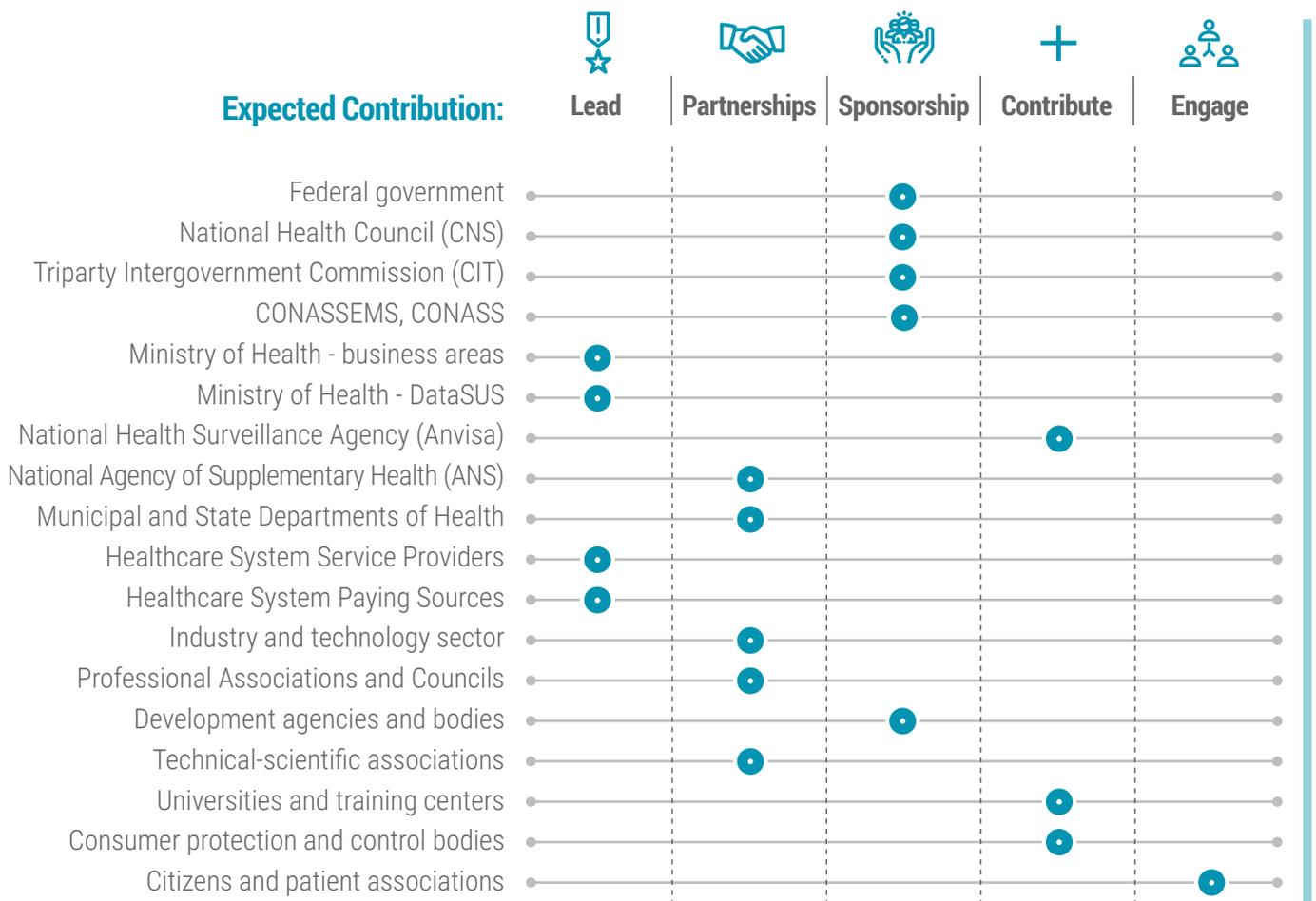
Source: own preparation.

EXPECTED BENEFITS:

- better service to the user at all levels of care and regardless of the location of the service;
- contribute to the management of healthcare services by analyzing the efficiency, effectiveness and efficacy of care at all levels;
- open the door to countless opportunities for improving care and management, serving as the basis for the ethical and innovative use of Healthcare Information.

EXPECTATION OF COOPERATION:

Figure 48 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.1.4 Promoting interoperability with pharmacy services

This action focuses on providing mechanisms and developing syntactic, semantic, operational and organizational interoperability practices and experiences so that information systems used by prescription and drug dispensing services interoperate with each other, not only within the public sector, but also within private healthcare and private health insurance.

Interoperability between systems, such as those for clinical information, electronic health records, electronic prescriptions and drug dispensing, is essential to provide pharmacological safety, prevent abuse of self-medication and drug interactions and prevent fraud.

For outpatients, interoperability between systems should represent an easy understanding of the prescription and its presentation in the private or public pharmacy. The benefits of this in-

teroperability can also reach the means of payment, the traceability of medicines, the abuse of drugs and even, with the consent of the patient, the monitoring of adherence to treatment. Due to the diversity of classes of stakeholders involved, in this priority, the actions to achieve it must include:

- to identify and attract relevant stakeholders;
- to identify the essential functionalities and their requirements for each stage of the project cycle;
- to establish, exercise, validate and disseminate the models, standards, rules and results obtained in each project cycle.

The activities that form the scope of the Promotion of Interoperability with Pharmacy Services are expected to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 49.

Figure 49 – Estimated time to perform this action



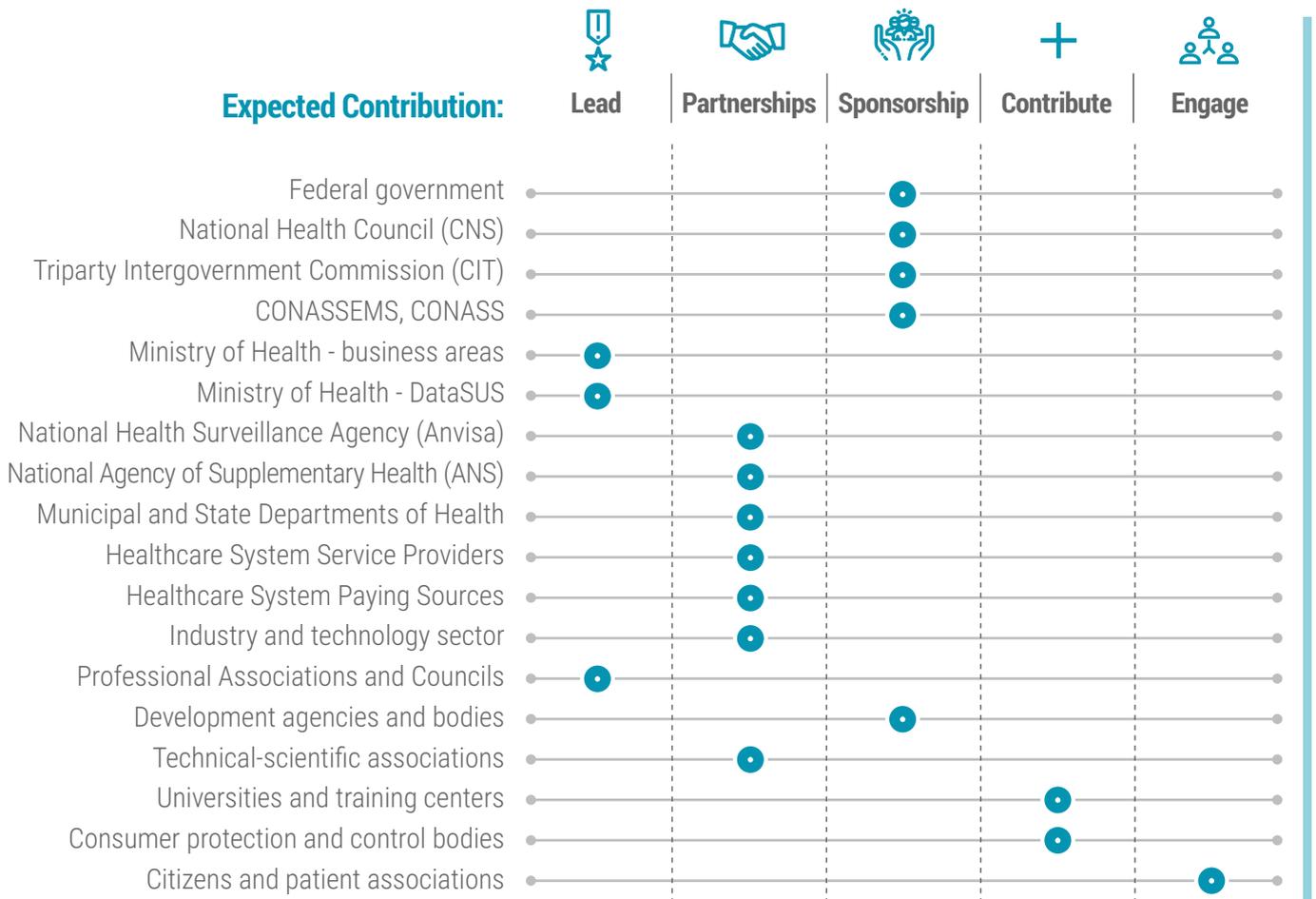
Source: own preparation.

EXPECTED BENEFITS:

- better service to users of healthcare services;
- greater pharmaceutical safety for the patient;
- greater ability to control drug dispensing and use.

EXPECTATION OF COOPERATION:

Figure 50 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.1.5 Promoting interoperability with telehealth services

This action recognizes that telehealth, in its various forms, such as teleconsultation, teliagnosis, teleconsulting, and second opinion, among others, has gained a prominent position over the last few years and, especially, during the pandemic of the new coronavirus.

To accomplish the full potential value of telehealth, it is necessary that it be integrated into the clinical routine in all its dimensions, including legal aspects, informed consent practices, service quality criteria, care regulation and interoperability with the information systems, especially the clinical appointments and discharge summaries of care.

The activities listed below aim to incorporate telehealth into the routine of healthcare processes in an integrated manner in all dimensions:

- to attract public and private stakeholders;
- to define minimum information content for telehealth;
- to identify specific patterns for telehealth;
- to define quality criteria for telehealth services and systems;
- to define criteria for the regulation of telehealth care;
- to implement and test models of telehealth systems and services;
- to widely disseminate lessons learned.

The activities that form the scope of the action to Promote Interoperability with Telehealth Services are scheduled to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 51.

Figure 51 – Estimated time to perform this action



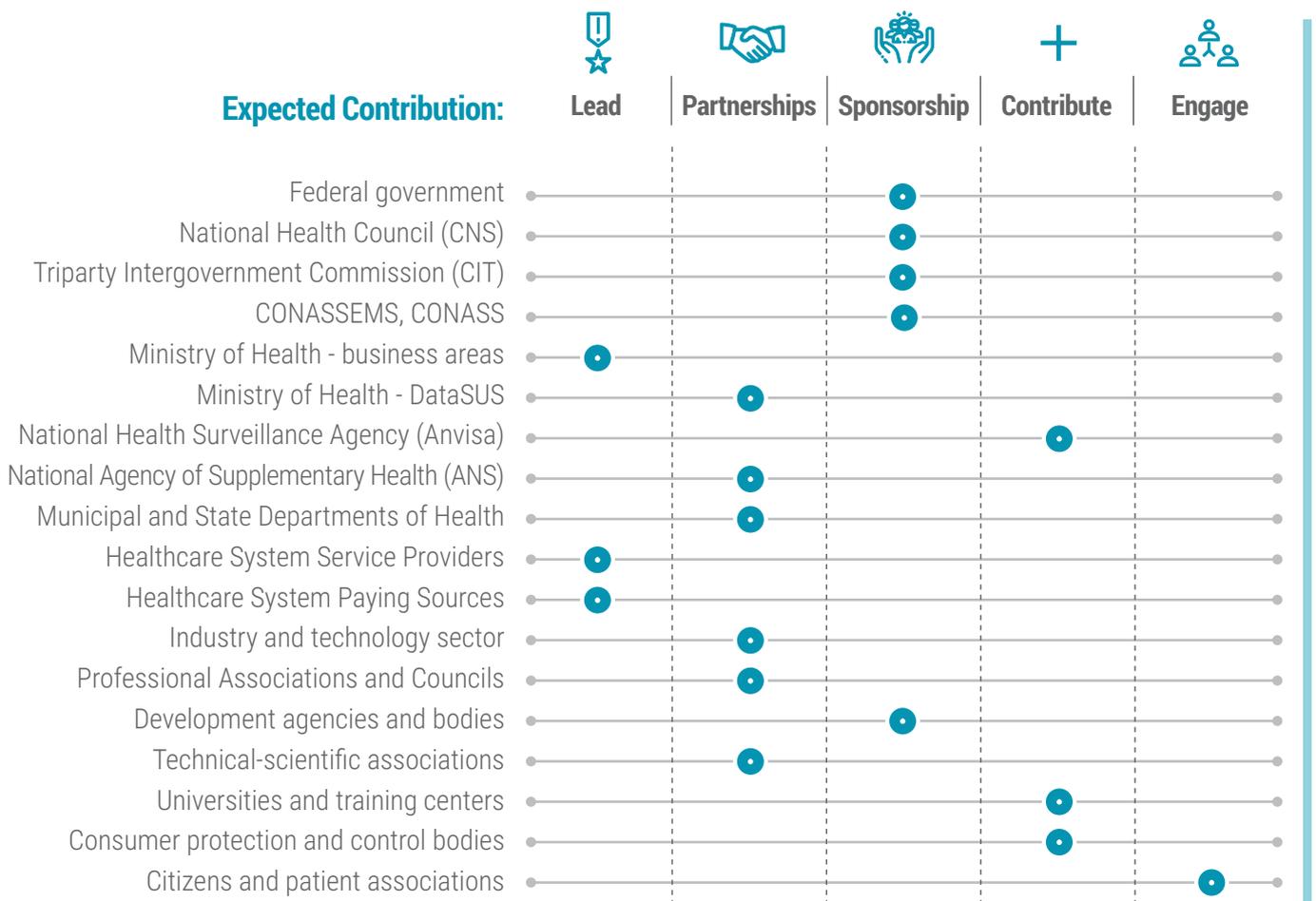
Source: own preparation.

EXPECTED BENEFITS:

- integrated information for diagnosis and therapy will benefit the professional and the user;
- breaking down regional barriers of remote care will benefit users and organizations;
- integration between public and private health insurance systems will be beneficial to all stakeholders.

EXPECTATION OF COOPERATION:

Figure 52 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.1.6 Implement outpatient access management services

This activity aims to make the Access Management of Healthcare widely used throughout the country, as a way to optimize healthcare resources.

Healthcare Access Management is an essential precept that can only be successful with the widespread use of information systems that support the also essential healthcare pact, including the sharing of public and private resources. It should be noted that the concept of Access Management of healthcare has been expanding to Private Health Insurance.

This priority includes the following activities:

- to develop mechanisms, practices and experiences of syntactic, semantic, operational and organizational interoperability so that information systems used by services for appointment scheduling, tests and outpatient

procedures interoperate with each other, not only within the public sector, but also within private healthcare and private health insurance;

- to explore aspects of agreement and organizational and technological interoperability that make access management feasible as the great strategic instrument for resource optimization and public and private assistance productivity, which is its vocation;
- to try and evaluate outpatient resource sharing models among all stakeholders who so wish, public or private, and also between public and private spheres.

The activities that form the scope of the Access management Services Implementation action are scheduled to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 53.

Figure 53 – Estimated time to perform this action



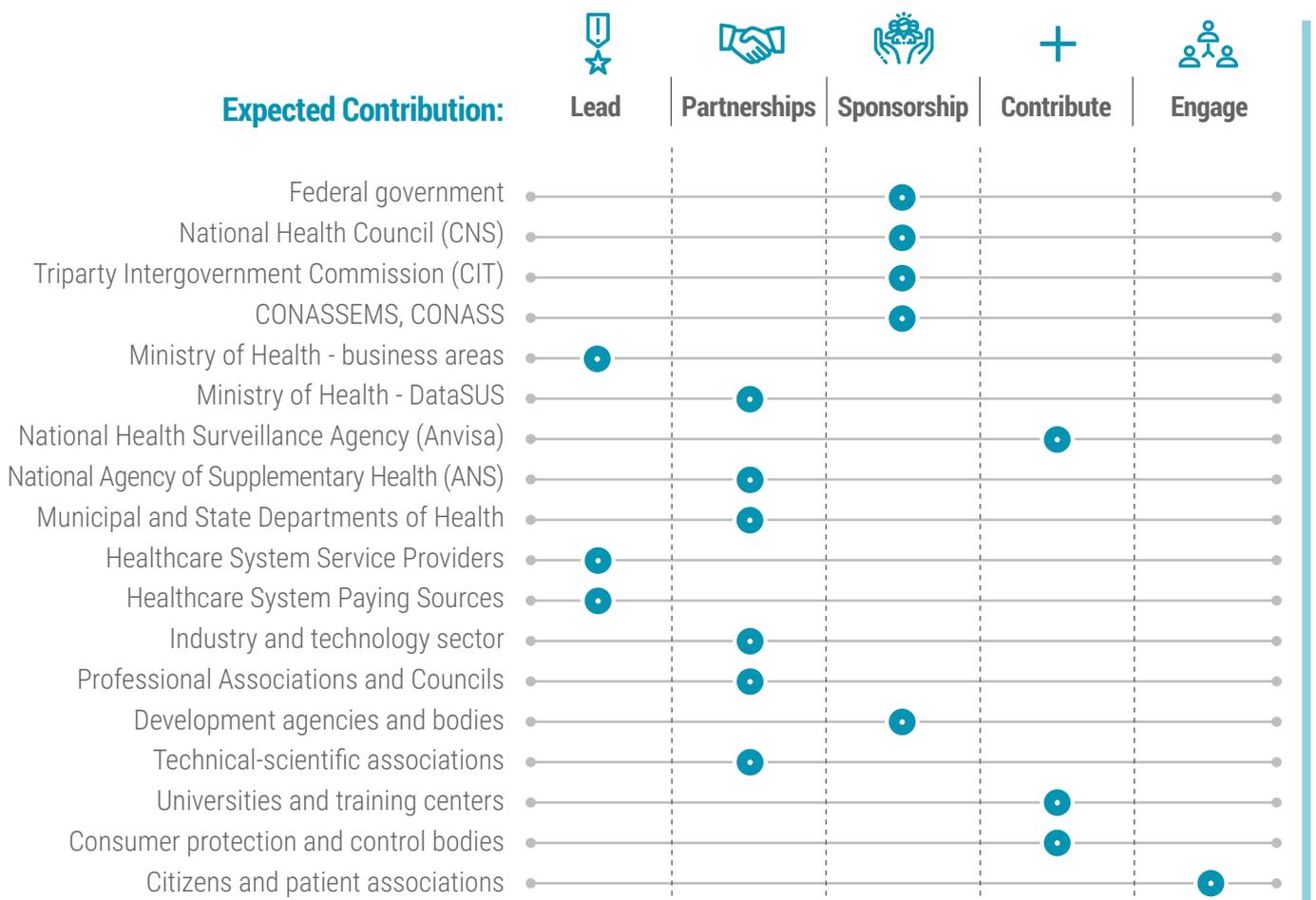
Source: own preparation.

EXPECTED BENEFITS:

- the optimization of healthcare resources made possible by Regulation results in greater availability for the patient and a reduction in costs for the health-care system;
- greater comfort for the patient who can be seen in less time and with scheduled appointment.

EXPECTATION OF COOPERATION:

Figure 54 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.2 STANDARDS AND TERMINOLOGIES

The establishment of standards for the exchange of healthcare information, including clinical terminologies, is essential for this priority to be achieved and constituted as a core element for the expansion of services and functionalities that meet the interests of all healthcare sectors.

6.2.1 Strengthening the health terminology repository (RTS)

Terminology repositories, including clinical terminologies and corresponding terminology services, are essential components of the architecture to meet the Strategic Digital Health Vision. Thus, this action aims to identify and implement all the necessary components so that the Health Terminology Repository is the element of the architecture that offers classic terminology services, including mapping between terminologies, access to ontologies, semantic mapping and similarity between terms, to name just a few.

In this regard, it is important to recognize that certain terminologies permeate different specialties and levels of care – such as those that describe diagnoses or procedures – while others address

specific domains, such as those used in clinical trials, for example.

The environment of collaboration and innovation, characteristic of the Digital Health Strategy, should allow terminologies aimed at specific purposes to be proposed and tested and, in case of success, incorporated into the RNDS and contributing to making it the national platform for Digital Health.

The activities to be developed include:

- to establish terminology needs for each RNDS development cycle;
- to establish the governance of the terminologies adopted for each RNDS development cycle;
- to exercise, validate and publish the terminology services implemented, as well as the governance model adopted.

The activities that form the scope of the action to Strengthen the Health Terminology Repository started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 55.

Figure 55 – Estimated time to perform this action



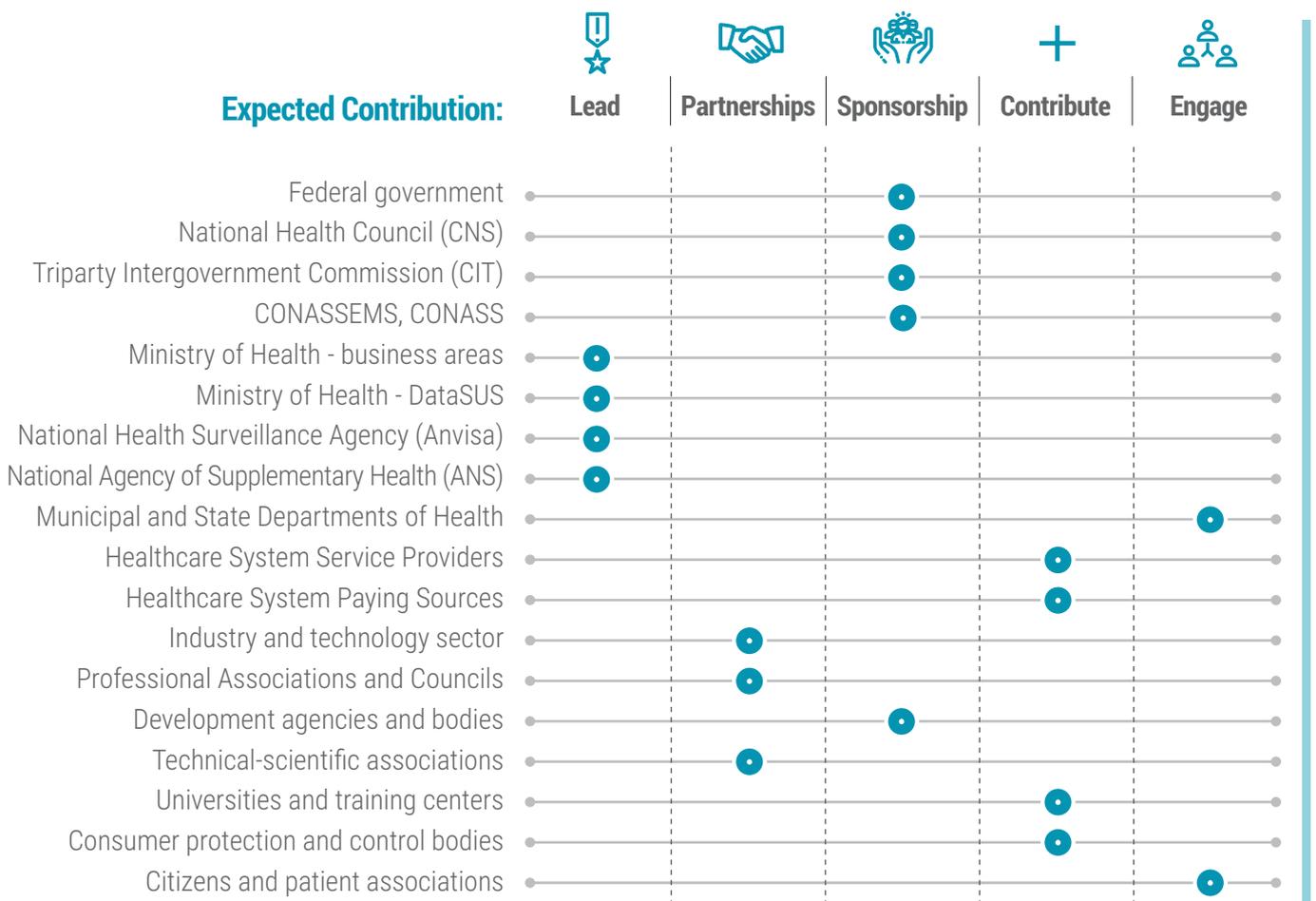
Source: own preparation.

EXPECTED BENEFITS:

- terminology services enable interoperability between systems, promote the quality of information – especially the clinical ones – and result in better patient care, greater capacity for healthcare quality management, for the benefit of citizens, professionals and managers.

EXPECTATION OF COOPERATION:

Figure 56 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

6.2.2 Developing standards for Healthcare information

This action is aimed at defining and adopting rules and standards for the representation, storage, exchange and use of healthcare data, including clinical terminologies and legal aspects regarding the use of information, such as LGPD. Therefore, it must be carried out collaboratively among ESD participants, thus, its result will be a collaborative environment for the definition of rules and standards to be adopted by ESD.

The definition of standards such as those described above is the essence of RNDS, that is, the definition of Health Informatics standards enables interoperability between systems, promotes legal security, pharmacological security, ensures confidentiality, privacy and secrecy of information, allowing, in addition, the automation of procedures and, above all, enabling better healthcare. The interconnectivity ecosystem of which this action is part, must set up a Space for Construction, adoption, adaptation and testing of standards for healthcare information, which can be

incorporated into the RNDS, enriching it and thus contributing to the fulfillment of its vocation as a digital health service and information platform.

The activities to be developed include:

- to establish the governance of interoperability standards, in harmony with the policies and criteria established throughout the development of Priority 1;
- to establish the set of functionalities to be met to each RNDS development cycle;
- to establish, exercise, validate and disseminate requirements, rules, criteria for use, models and standards adopted to meet the expected functionalities.

The activities that form the scope of the action of Standards Development for Health Informatics started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 57.

Figure 57 – Estimated time to perform this action



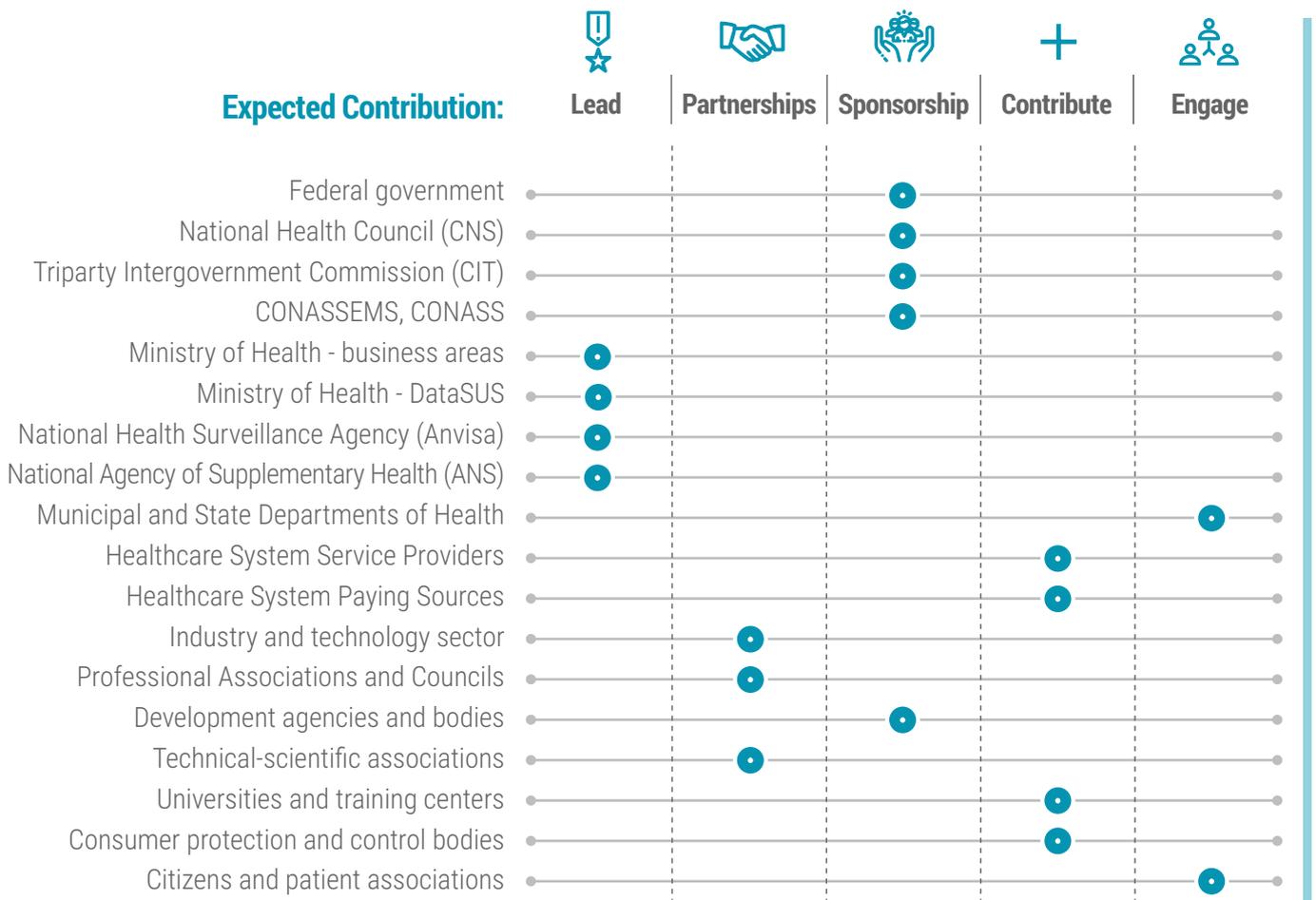
Source: own preparation.

EXPECTED BENEFITS:

- a Collaborative and productive Space aimed at experimenting and adopting standards for healthcare information, enabling better interoperability, better systems, comprehensive and integrated care, based on information and evidence.

EXPECTATION OF COOPERATION:

Figure 58 – Stakeholder participation expectation to accomplish this action



Source: own preparation.



INNOVATION ECOSYSTEM

To ensure that there is an Innovation Ecosystem that makes the most of the Health Interconnectivity Ecosystem, establishing itself as a large open innovation laboratory, subject to the regulations, standards and policies established through priority 1.

Priority 7: Innovation ecosystem

7.1 EXPANSION OF RND'S INTEGRATED SERVICES

7.1.1 Promote support for healthcare encounter

7.1.2 Develop Health Surveillance initiatives

7.1.3 Implement electronic prescription services

7.1.4 Implement access management services

7.2 DISTRIBUTED INNOVATION ECOSYSTEM

7.2.1 Develop initiatives in IoT, Big Data and secondary use of data

7.2.2 Implement the Health Data Lake

7.3 VALUE-BASED HEALTHCARE

7.3.1 Explore value-based Healthcare value models

7.4 ASSESSMENT AND INCORPORATION OF NEW TECHNOLOGIES

7.4.1 Support the incorporation of innovations

7.4.2 Use translational research resources

Priority 7: Innovation ecosystem

This priority aims to stimulate an Innovation Ecosystem that makes the most of the Health Interconnectivity Ecosystem, and the Collaborative Space, establishing itself as a large open innovation laboratory, regulated by the regulations, standards and policies established through Priority 1. In addition, this priority points to the importance of developing an ecosystem in which SUS, private and philanthropic healthcare organizations, technology companies, research centers, universities and other stakeholders can, respecting established ethical and legal criteria, share data and experiences, as well as exercise, test and evaluate new models, standards and technologies.

The consensus is achieved that it is necessary to innovate in order to seek alternative solutions capable of encouraging a service provision that is more aligned with the users' needs and desires than with the generation of revenues. We are facing a time when both publicly funded healthcare systems and the private sector are moving towards value-based healthcare.

The expansion of RNDS Integrated Services, which covers the interoperability of information collected in healthcare facilities, as well as the incorporation of innovative technologies, methods, models and processes, is at the core of the transformations that the world is experiencing today. The Digital Health Strategy for Brazil reinforces that the success of initiatives aimed at strengthening value-based healthcare encompasses the discussion of technological innovations, alternative reimbursement models and research and development aimed at the continuous improvement of the quality of healthcare and sector sustainability.

The Innovation Ecosystem will prioritize support for initiatives aimed at creating and incorporating emerging technologies that are naturally, conceptually and operationally integrated with the Health Interconnectivity Ecosystem and that, in this way, can be incorporated into it. As the Innovation Ecosystem expands and consolidates to include Private Health Insurance, we will be much closer to a model that allows the use of best practices and evidence as instruments for jointly conducting discussions about healthcare innovations.

Expected benefits of this action for citizens and for the Brazilian health-care system:

- structuring of a collaborative network that encourages the sharing of experiences, knowledge, cultures and practices among the stakeholders;
- training of highly qualified human resources in R&D;
- increased synergy among healthcare innovation initiatives;
- greater autonomy for the stakeholders to engage in healthcare innovation initiatives;
- cost reduction and increased productivity and quality;
- promotion of initiatives to strengthen Value-Based Healthcare.

This priority is subdivided, as we will see next.

7.1 EXPANSION OF RNDS INTEGRATED SERVICES

This subpriority aims to meet the need to exchange information in Health at all levels, to allow health information – clinical, administrative and related to patient flow management – to be accurate and available wherever and whenever necessary, for users, health care workers and managers. The expansion of these services brings meaning to the RNDS and brings it closer to the Vision for 2028. Among the services to be expanded, are those that promote support for the encounter, aim at ensuring clinical information at the time of care, support health surveillance actions, implement electronic prescription systems, and help establish robust systems for Patient Flow Management.

For these strategic actions to be attained, it is essential that the concept of interoperability permeates all actions, including the notion of syntactic, semantic and organizational interoperability, that is, the information that passes through RNDS must have clear meaning, support well-established processes and be focused on the real needs of the Health System. In addition, all new services must be aligned with the ethical, legal and organizational criteria established by ESD28 and, in particular, by the Governance of the Digital Health Strategy.

It is important to note that the Expansion of Integrated Services to RNDS is not exclusively focused on Conecte SUS, but also aims for the actors of Supplementary Health to see in RNDS the platform of innovation, information and digital health services that it is intended to be, and thus not only support the expansion of services already proposed, but participate in the Collaboration Space, proposing and collaboratively building new services of interest to SUS, the health sector and the country.

7.1.1 Promote support for care encounter

Meeting this priority makes it possible for records of healthcare encounters made in public or private EAS to be shared between different healthcare facilities, thus promoting referral information and assuring comprehensive healthcare.

RNDS will allow public and private healthcare facilities to send information collected in healthcare encounters, such as consultations, hospitalizations and vaccinations, so that they are stored and made available according to confidentiality and security standards proportional to their sensitivity.

The challenge of sharing healthcare encounter data includes the definition of clinical models and common terminologies and the creation of messages via Fast Healthcare Interoperability Resources (FHIR), a widely accepted international standard that allows interoperability between different healthcare information systems. The “Healthcare Encounter” has already been defined as the information standard of the healthcare service record as part of the Minimum Data Set (CMD).

Access to this data, however, must be subordinated to its fundamental objective: improving care.

Therefore, only the following will have access to this information:

- the citizen himself/herself (through the Conecte SUS Portal – Citizen Profile), through authentication of the access performed in the GOV.BR system (means of user’s digital access to digital public services).
- healthcare professionals (through the Conecte SUS Portal – Healthcare Professional Profile), through authentication of the ICP-Brazil Digital Certification of Electronic Patient Record facilities previously qualified for the respective EAS and restricted to the service context, that is, only during the consultation of the citizen.

The activities that form the scope of the Promotion of Support to Healthcare Encounter started in 2020. The estimated time for prioritizing this action throughout the ESD is shown in Figure 59.

Figure 59 – Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- improved service through access to healthcare information;
- greater security and quality in the data collected and shared;
- strengthening the continuity of care;
- strengthening the government’s capacity for action in the formulation of public policies.

EXPECTATION OF COOPERATION:

Figure 60 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.1.2 Develop Health Surveillance initiatives

The main objective of this action is to allow records of notifications and test results by the public or private network to be shared between the different levels of care.

RNDS, the national healthcare data integration platform, will allow public and private establishments to send notifications of events associated with illnesses or for laboratories to send test results.

The sharing of test results was driven by the RNDS ability to assist in the fight against the new coronavirus, thus establishing itself as a critical tool for the pandemic coping strategy through the following activities:

- receiving and integrating notifications and results of laboratory tests related to Covid-19;

- sending the test results to the citizen and to the healthcare professionals authorized by him/her (Conecte SUS Portal);
- the action also includes the definition of clinical information models, the definition of common terminologies and the creation of messages that allow interoperability between different healthcare information systems;
- the integrated services of RNDS should be expanded to include actions of immunization programs, registration of cases of diseases of mandated notification and health surveillance.

The activities that form the scope of the Development of Health Surveillance Initiatives started in 2020. The estimated time to perform this action throughout the ESD is shown in Figure 61.

Figure 61 – Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- real-time processing capacity for large numbers of healthcare data;
- improvement in abilities of case management and decision making;
- greater control of epidemic outbreaks by strengthening the healthcare system's response;
- monitoring and management of Population Health in real time;
- tools for active citizen engagement in fighting epidemics.

EXPECTATION OF COOPERATION:

Figure 62 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.1.3 Implement electronic prescription services

This action aims to allow records of drug prescriptions made by public or private healthcare facilities to be shared, according to ethical criteria and legal precepts, between the different service locations and pharmaceutical facilities.

Ongoing initiatives between partners such as CFF, CFM and the National Institute of Information Technology (ITI) resulted in the definition of a standardized model for electronic prescriptions and in the provision of a secure authentication platform, ensuring safety in the release of medicines in pharmacies.

The evolution of Digital Health will allow public and private healthcare facilities to send prescriptions to RNDS, from where they will be made available to pharmaceutical facilities. The main objective of this action is to improve the population's access to medicines and strategic inputs. To this end, this action includes:

- articulation with the Federal Councils of Pharmacy, Dentistry and Medicine, as well as healthcare service providers to expand sponsorship and engagement of the professionals involved;
- definition of clinical information models and creation of FHIR messages that allow interoperability between different information systems;
- definition of common terminologies that promote the development of a National Drug Database.

The use of integrated RNDS services for electronic prescription will boost, for example, the remodeling of the Farmácia Popular Program in Brazil.

The activities that form the scope of the Electronic Prescription Implementation started in 2020. The estimated time for the execution of this action throughout the ESD is illustrated in Figure 63.

Figure 63 – Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- improved service to users through access to healthcare information;
- greater security and quality in the data collected and shared;
- digital end-to-end process, allowing the entire process to be tracked;
- fraud reduction based on the integration of bases and transparency to the stakeholders involved.

EXPECTATION OF COOPERATION:

Figure 64 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.1.4 Implement access management services

This action aims to allow data related to the existence and availability of assistance resources to be shared by health-care facilities and by state and municipal managers, enabling access management and intelligent use of available resources.

RNDS, the national healthcare data integration platform, will allow public and private facilities to send their availability of resources, assisting health managers in the definition of criteria and assistance flows, in the organization of their referral information networks or even in the management of queues of elective services.

This action includes:

- articulation with municipal and state managers, as well as providers and payers of healthcare system services.
- alignment of roles and responsibilities;

- definition of clinical information models and common terminologies;
- creation of data exchange messages that allow interoperability and integrated management of assistance networks;
- detailing of the scope of ambitions, boundaries, potential and challenges arising from the implementation of an intelligent model to support regulation;
- potential volume of data for RNDS with inventory of hospital beds related to Covid-19, and other infectious diseases, which has been done since April 2020.

The activities that form the scope of the Implementation of Access management Services are expected to start in late 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 65.

Figure 65 – Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- improved access to healthcare services;
- better queue management and reduced waiting time for elective services;
- efficiency and intelligent distribution of care network resources;
- strengthening the government’s capacity for action in the formulation of public policies.

EXPECTATION OF COOPERATION:

Figure 66 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.2 DISTRIBUTED INNOVATION ECOSYSTEM

Develop an ecosystem in which the Brazilian NHS (SUS), public and private healthcare organizations, technology companies, research centers, universities and other stakeholders can, respecting established ethical and legal criteria, share data and experiences as well as exercise, test and evaluate new models, patterns, technologies and design.

7.2.1 Develop initiatives in IoT, Big Data and secondary use of data

The advancement of technologies applied to health and smart devices that collect and store information automatically (internet of things or IoT) have enabled the mass generation of structured, semi-structured and unstructured data.

The future of health depends on the capacity to store, process, organize, manage and use these data sets from a wide variety of sources. For this variety of information to result in the generation of analysis and insights for managers and healthcare professionals, advanced solutions, such as Big Data, must be used.

The Innovation Ecosystem should act as a catalyst for inclusive initiatives from the public and private sectors aimed at the use of healthcare data and smart

devices, which result in the design and use of solutions that support healthcare professionals and managers, automate processes and, thus, improve healthcare services.

This action includes the following activities:

- to attract public and private healthcare organizations to identify, together with all stakeholders, priority scenarios for the use of these advanced technologies;
- to attract stakeholders already involved in Big Data and IoT efforts in Healthcare, to share knowledge and propose and execute the essential set of initiatives, using RNDS as a structural element, as a testing ground for initiatives and for their use in production, when possible;
- to analyze the results obtained in each cycle, disseminating the knowledge obtained and defining new initiatives.

The activities that form the scope of development of initiatives in IoT, Big Data and secondary use of data are expected to start in late 2022. The estimated time for carrying out the action throughout the ESD is illustrated in Figure 67.

Figure 67 — Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- generation of relevant data for the healthcare area, stimulating the improvement of the management process by governments, companies, the third sector and any other branches of the healthcare sector;
- strengthening of cloud solutions, making infrastructure cheaper and allowing gains in scalability, agility and flexibility;
- real-time monitoring of population health conditions, strengthening the healthcare prevention and promotion process.

EXPECTATION OF COOPERATION:

Figure 68 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.2.2 Implement the Healthcare Data Lake

Thinking of solutions aimed at the comprehensive healthcare of the population goes directly through the generation of instruments capable of guiding the decision making of managers, doctors, professionals and other stakeholders involved in the public and private healthcare sectors. A fundamental premise for the improvement of comprehensive care is that it is essential to use the right information, at the right time and in the right place, so that decision making can be done in a professional and evidence-based manner.

The Data Lake consists of a technological architecture capable of storing and making available a high volume of data without the need for previous treatment, at very a high speed, allowing a centralized repository for sharing information with access tools and analysis in real time.

Through a Data Lake, healthcare organizations can access a myriad of data, coming from diverse sources such as

public and private healthcare systems, such as electronic health records, immunization, hospitalization and hospital discharge records, as well as sensors and several applications.

Among the activities necessary for a Data Lake of healthcare information based on the RNDS and to strengthen it, the following stand out:

- to develop governance for the generation and use of public and private data;
- to establish legal and ethical criteria for the use of data, respecting the LGPD, in line with other ESD actions, especially those of Priority 1;
- to plan and execute the essential set of initiatives that enable the coordinated use of the Data Lake.

The activities that form the scope of the Health Data Lake Implementation action started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 69.

Figure 69 – Estimated time to perform this action



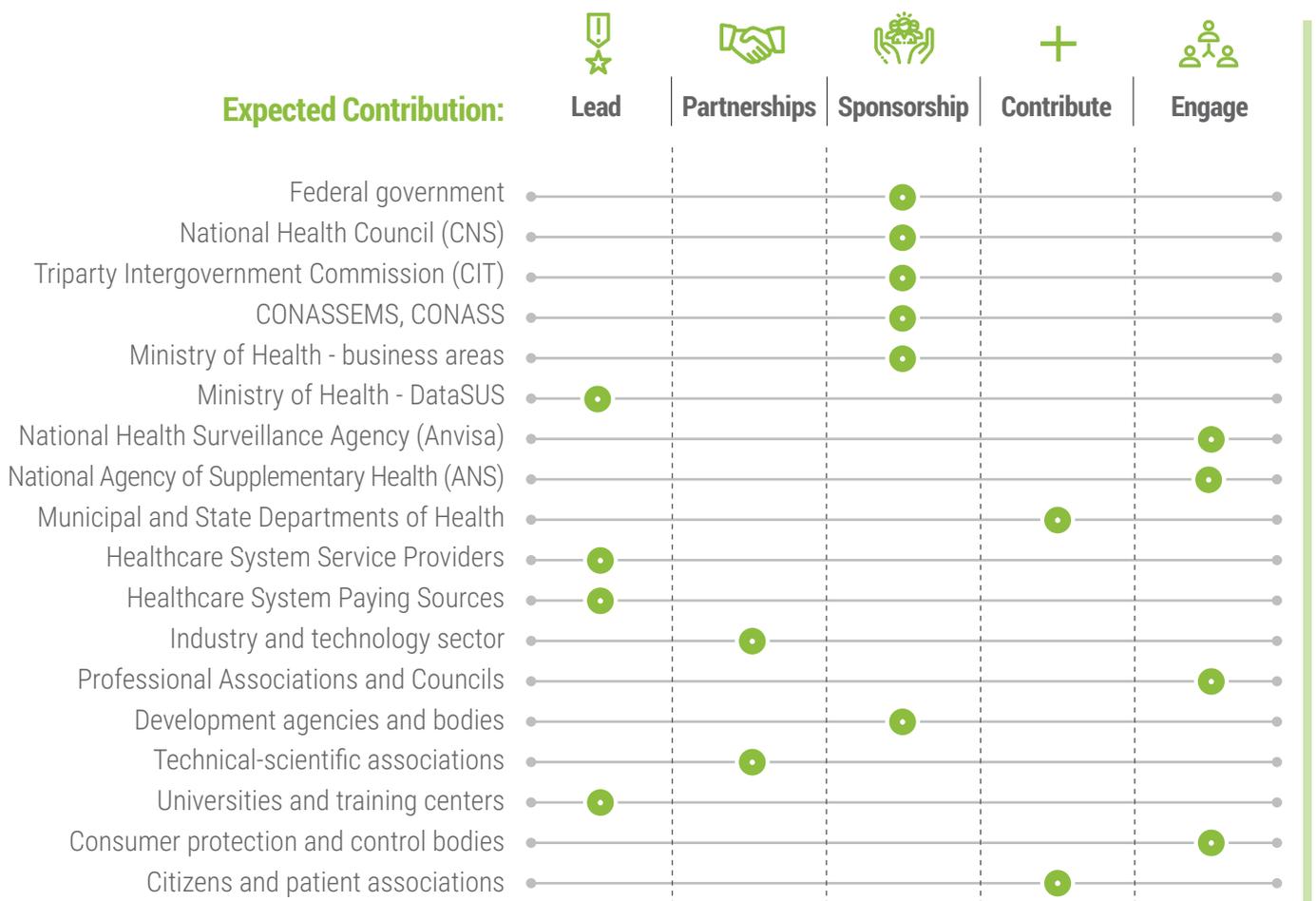
Source: own preparation.

EXPECTED BENEFITS:

- encouraging collaboration between different branches of the healthcare sector to share information and evaluate healthcare data;
- organization, qualification and use of information generated to generate inputs for Big Data and data modeling tools;
- innovation ecosystem fed by different sources of information.

EXPECTATION OF COOPERATION:

Figure 70 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.3 VALUE-BASED HEALTHCARE

Value-based healthcare assessment models seek the essence of healthcare, with a focus on aspects such as clinical outcome, patient and family satisfaction, environment, communication and relationships, among many others. Measuring health value is not a trivial task, but it has benefited from new technologies, which empower patients and communities, offering timely access to healthcare information, mechanisms to express their expectations and treatment and conduct options, thus allowing that measures of value in healthcare can be explored with scientific rigor.

7.3.1 Explore Healthcare value models

This action has the central objective of using the Collaborative Space as a testing ground for the exploration of concepts, models, methods and data sets that can lead to healthcare value measures capable of reflecting the wishes of all healthcare stakeholders.

Value-oriented healthcare systems should, in principle, result in lower costs for patients and families, greater efficiency for providers, more satisfied patients and lower and more predictable costs for paying sources. The notion of “value” for the user of healthcare services, for the professional, for the manager and for

organizations that provide or use healthcare services and products is poorly understood and tends to contaminate the discussion of the cost-quality ratio.

This action also has the purpose of stimulating and making feasible research that leads to constructive insights on the measurement of healthcare value for all stakeholders in the Brazilian healthcare system.

The activities to be developed include:

- to identify and attract stakeholders who have experience and interest in the topic, to propose the initial range of initiatives;
- to use the Collaborative Space and the RNDS structure to test and evaluate models of value analysis, under the focus of the various stakeholders in the healthcare system;
- to disseminate the results of the assessment and expand the models as needed.

The activities that form the scope of development of initiatives that explore New Health Value Generation Models are scheduled to start in late 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 70.

Figure 71 – Estimated time to perform this action



Source: own preparation.

EXPECTED BENEFITS:

- value-based healthcare management models;
- reduced costs for users and paying sources;
- ability to measure objective value and perceived value by all stakeholders.

EXPECTATION OF COOPERATION:

Figure 72 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.4 ASSESSMENT AND INCORPORATION OF NEW TECHNOLOGIES

The incorporation of innovative technologies, methods, models and processes is the essence of the transformations that the world is experiencing today. The Digital Health Strategy for Brazil defines as a priority that the Innovation Ecosystem supports initiatives aimed at the creation and incorporation of emerging technologies that are naturally, conceptually and operationally integrated with the Health Interconnectivity Ecosystem and, thus, can be quickly incorporated into it.

7.4.1 Support the incorporation of innovations

The technological incorporation process is central to the induction of strategies for driving healthcare innovations. In the Brazilian NHS (SUS), the National Commission for the Incorporation of Technologies (CONITEC) is responsible for advising the Ministry of Health on the incorporation, exclusion or alteration of healthcare technologies and on the constitution or alteration of clinical protocols and therapeutic regulations.

The Digital Health Strategy for Brazil 2020-2028 understands that one of the priority actions must be the strategic alignment between the processes of technological incorporation in the public and private sectors, with the objective of strengthening the

productive healthcare base in the country, stimulating a technological belt that generates jobs and knowledge for the sector, which will assist in guaranteeing the technological inputs necessary for the Brazilian healthcare system. In addition, the technological development brought about by the ESD should become one of the promoters of a high-density industrial policy and economic and social development.

Therefore, it is of paramount importance that this action includes:

- to attract and engage relevant Health and social development stakeholders;
- to propose and execute integrated models of cooperation to finance innovations in Digital Health;
- to induce industries, technology sectors, the productive system as a whole to strengthen a productive and innovation complex in Digital Health, aimed at the strategic healthcare and social development needs.

The activities that form the scope of development of initiatives that offer Support for the Incorporation of Innovations in Health are expected to start in late 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 73.

Figure 73 — Estimated time to perform this action



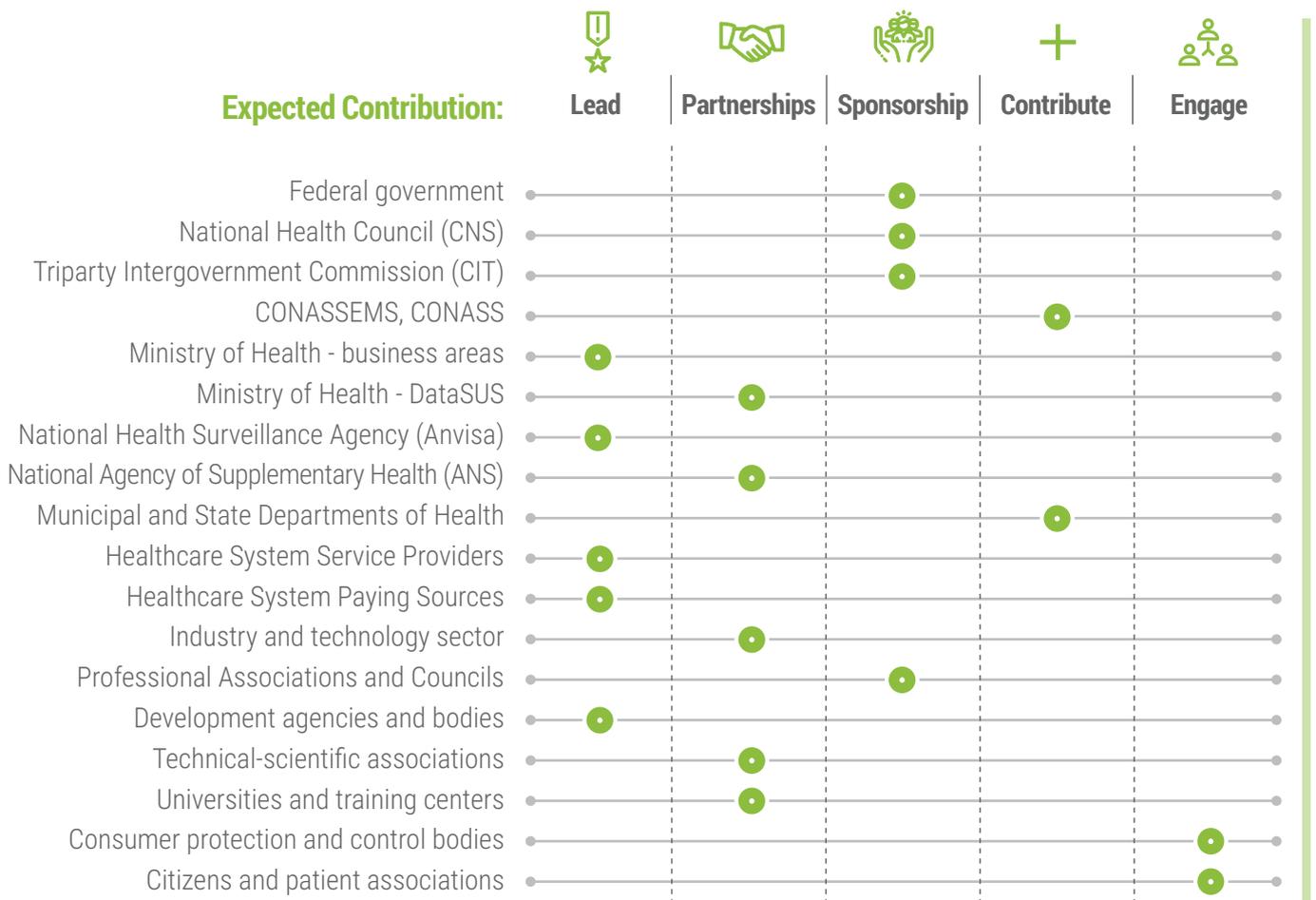
Source: own preparation.

EXPECTED BENEFITS:

- strengthening the use of studies and evidence to incorporate healthcare innovations;
- structuring of a national project to induce innovation and technological production in healthcare;
- engagement of the stakeholders involved in the healthcare sector to jointly create mechanisms to strengthen the productive healthcare base in the country.

EXPECTATION OF COOPERATION:

Figure 74 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

7.4.2 Use translational research resources

Translational research is a movement that seeks to quickly direct scientific discoveries made in laboratories and controlled scenarios to environments of production and use by frontline healthcare professionals.

The Innovation Ecosystem aims to promote the engagement and commitment of governments, technical-scientific associations, universities and training centers, professional associations, industry, development agencies and other branches involved in the healthcare sector to structure partnerships that strengthen the translational health research in its various lines, integrating the care and scientific community so that there is increasingly more synergy between those who produce knowledge and those who apply it in practice.

The final objective of this action is to make the Innovation Ecosystem operate in such a way that it is possible to quickly incorporate into the RNDS the results of

the innovation efforts, both from an organizational point of view – legislation, regulation, financing, rights and duties – and from a technological point of view, including adherence to standards, availability and security, to name just a few aspects.

The following are among the planned activities:

- to develop, implement and exercise organizational models and the necessary resources to make Translational Research in Digital Health viable;
- to systematically assess the adequacy of the proposed models and take action to correct, update or alter them to capture new values or adapt them to new needs.

The activities that form the scope of development of initiatives that stimulate and make use of Translational Health Research are scheduled to start in late 2022. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 75.

Figure 75 – Estimated time to perform this action



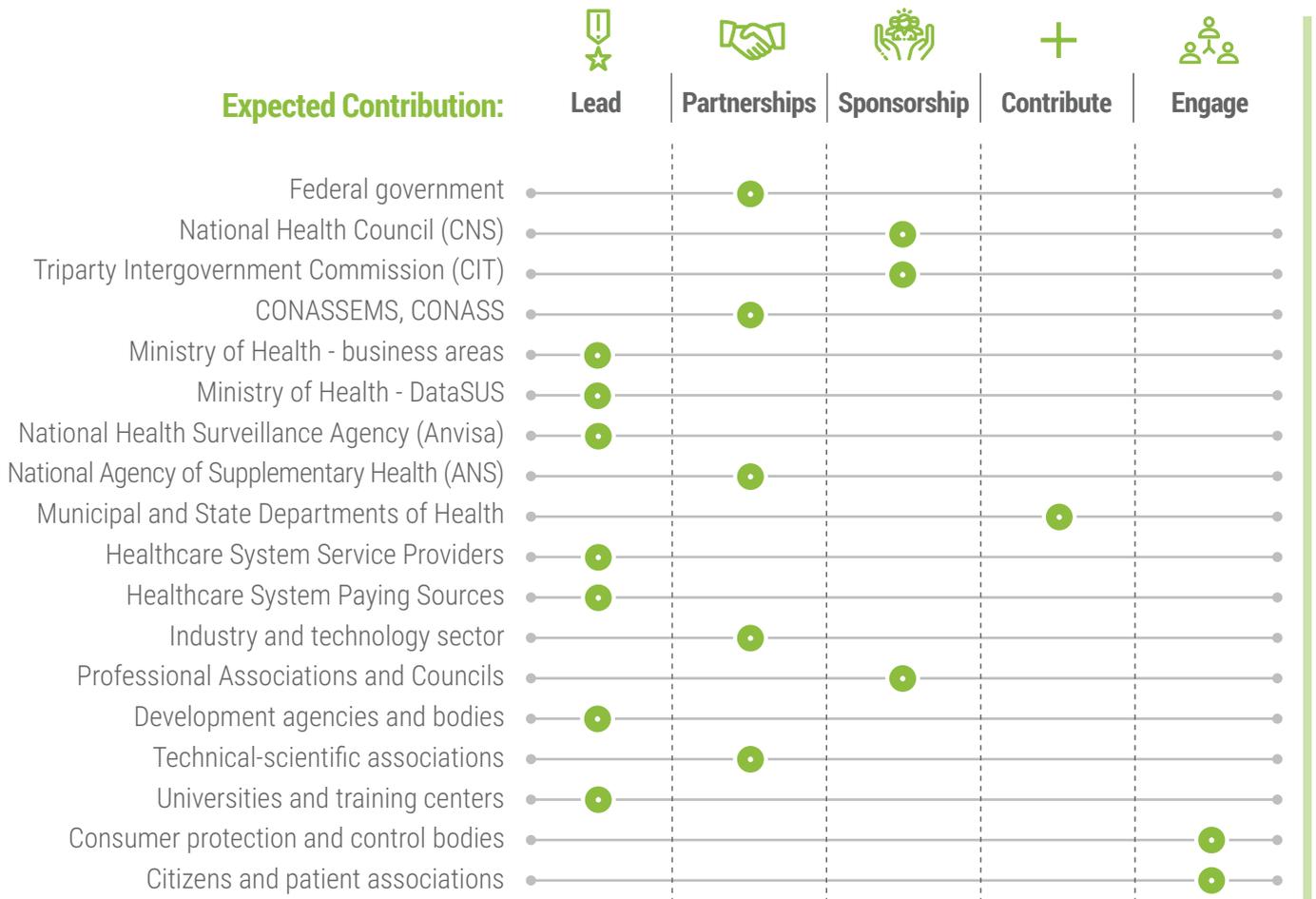
Source: own preparation.

EXPECTED BENEFITS:

- accelerating the absorption of innovation in Digital Health throughout the Brazilian healthcare system;
- stimulating the development of translational research in the country;
- approximation of science generated in the academy and fields of healthcare practice;
- improvement in prevention, diagnosis and treatment processes;
- strengthening the healthcare innovation and research sector in the country.

EXPECTATION OF COOPERATION:

Figure 76 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

4

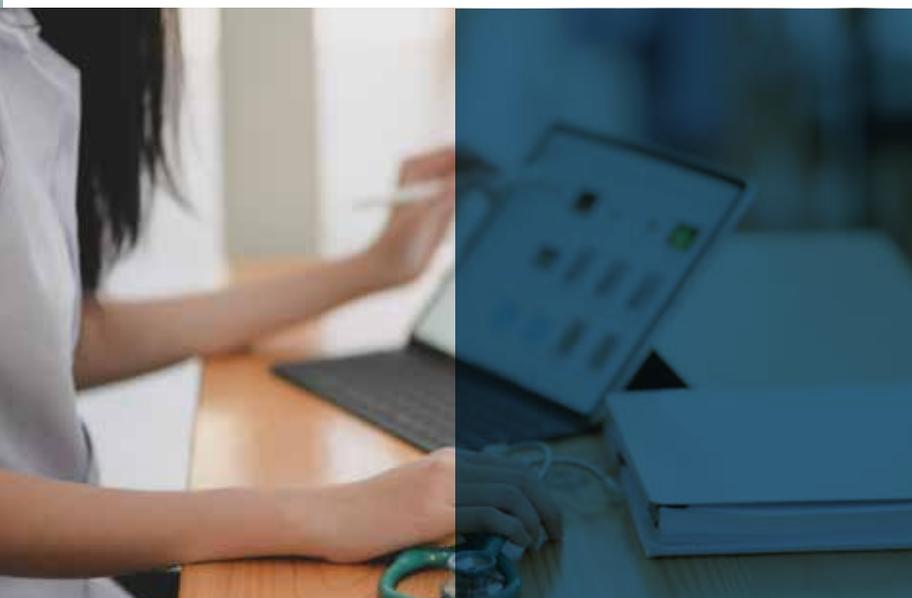


DIGITAL HEALTH MONITORING AND EVALUATION (M&E) PLAN

The Digital Health Monitoring and Evaluation Plan for Brazil for 2020-2028 describes the organization and governance of the Monitoring and Evaluation actions, as well as the set of activities to be performed and the respective responsible stakeholders. The M&E Plan meets the needs for monitoring and evaluation associated with the three pillars of action and the seven priorities proposed in the Action Plan.

The M&E Plan meets the needs for monitoring and evaluation associated with the three pillars of action and the seven priorities proposed in the Action Plan.

4.1 OBJECTIVE OF THE MONITORING AND EVALUATION PLAN



The actions proposed in the M&E Plan have as the central objective to enable the Action Plan to remain consistent and adherent to the Digital Health Vision, enabling systematic reviews to correct inadequacies, redirect actions, meet new needs and also take advantage of value capture opportunities that arise during the execution of the Action Plan.

The M&E Plan was centered on two major priorities that, when met, will lead to an M&E Plan increasingly feasible, robust and consistent with each review.

4.2 PRIORITIES FOR THE MONITORING AND EVALUATION PLAN

Priority 1: Consolidate the Conecte SUS Monitoring and Evaluation model

This priority is intended to consolidate the governance and the Monitoring and Evaluation processes of the Conecte SUS Program, which have been practiced and need to be consolidated as well as continuously expanded to meet the evolution of Conecte SUS, as proposed in the Action Plan.

The Monitoring and Evaluation governance model must meet three levels:

Strategic: with attention to the vision of Digital Health as a means to achieve healthcare system goals and offer strategic recommendations that aim not only to correct any mismatches, but, above all, to respond to new needs and capture emerging opportunities.

Tactical: responsible for managing the execution of the M&E Plan, in line with the ESD, and also responsible for providing data collection, as planned, and promoting its compilation, analysis, interpretation, understanding, extraction of insights and knowledge, leading to the strategic level the necessary inputs for a qualitative and quantitative objective assessment of the Action Plan development.

Operational: acts directly in the activities necessary for the execution of the Monitoring and Evaluation Plan. At this level, the calculation of indicators involves activities of data collection, qualification and analysis, as well as the calculation and inter-

pretation of each indicator and classes of indicators. The generation of each class of indicators must have a management structure, capable of coordinating and monitoring the actions developed and reporting the results to the management structures of Conecte SUS.

The expected benefits for citizens and the Brazilian healthcare system are:

- an efficient, effective and efficacious Conecte SUS Monitoring and Evaluation process;
- Conecte SUS adherent to healthcare needs, attentive and focused on the proper use of new technologies;
- directed to respond to emergency needs, when necessary;
- prepared to take advantage of opportunities of public interest;
- synergy between needs and efforts;
- ensuring an adequate cost-benefit ratio.

1.1 FORMALIZE THE CONECTE SUS M&E GOVERNANCE MODEL

This subpriority is aimed at strengthening and expanding the governance model of Conecte SUS, through the strengthening and consolidation of the instances that have already been used in the elaboration of monitoring actions and in the presentation of periodic evaluation reports.

1.1.1 Formalize and consolidate Conecte SUS M&E Governance instances

This action has the fundamental objective of formalizing and consolidating the instances used in the Monitoring and Evaluation processes of the Conecte SUS Program, at the strategic, tactical and operational levels, in accordance with the guidelines established in the PAM&E 2019-2023, also offering a look at the expansion of Conecte SUS and the interaction with other actions, present or future in the Digital Health Strategy.

The instances to be formalized can be defined as:

- Sponsorship of the Conecte SUS Monitoring and Evaluation Plan – allows the M&E Plan to be valued as an essential instrument for guaranteeing the Program's success.

- Supervision and Strategic Management of M&E of Conecte SUS – provides guidance and contribution to the definition of indicators, targets and monitoring processes, reviews and approves corrective or improvement recommendations.
- Management of the Execution of the M&E Processes of Conecte SUS – allows the M&E Plan to be executed satisfactorily, properly guiding the execution of the Action Plan and keeping it in line with the ESD objectives.

Among the activities to be developed the following can be mentioned:

- identification of the stakeholders in each instance;
- preparation of the attribution and competence documents;
- publication of the corresponding ordinances.

The activities that form the scope of the formalization of the Monitoring and Evaluation Governance Model for Conecte SUS started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 77.

Figure 77 – Estimated time to perform this action



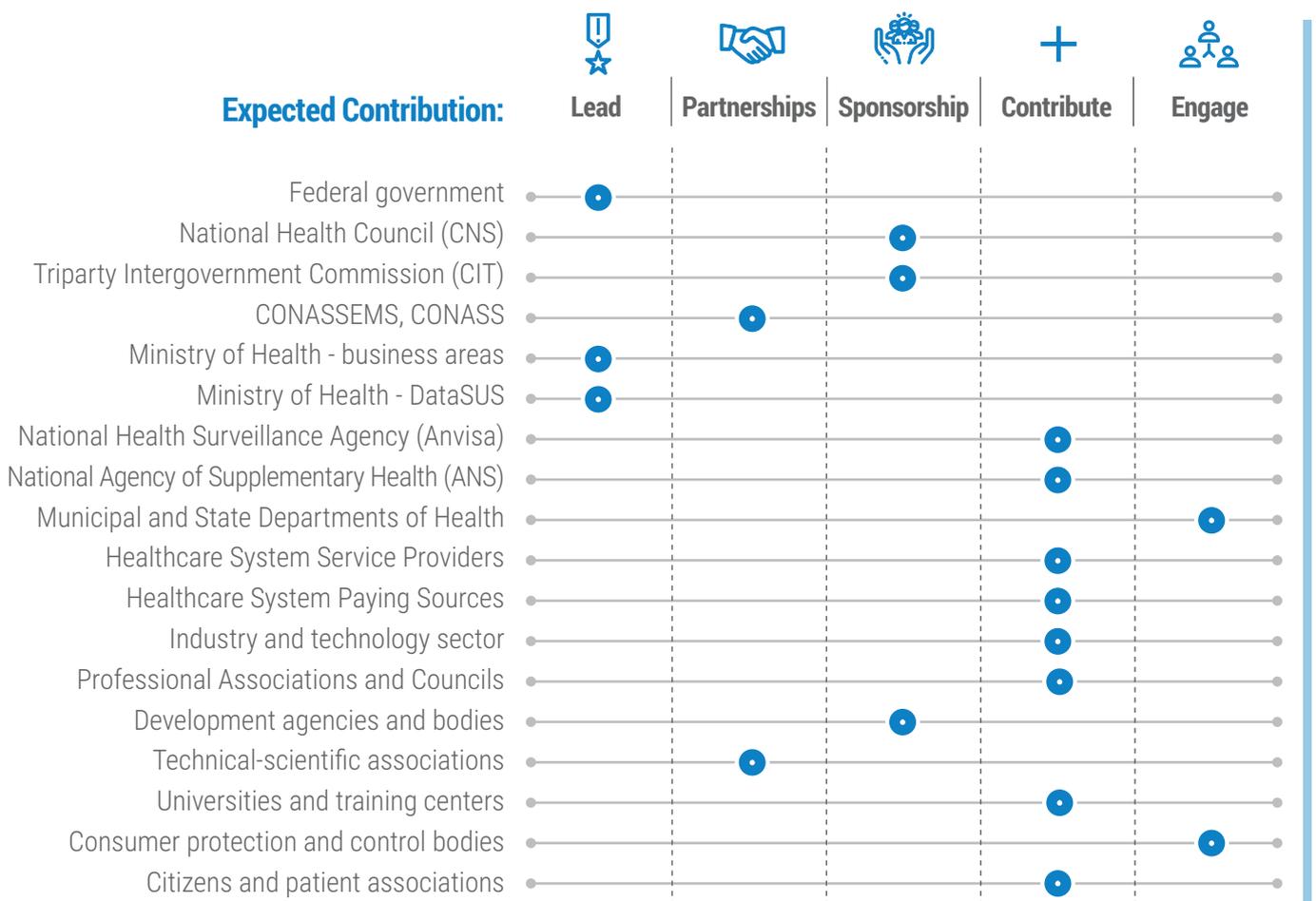
Source: own preparation.

EXPECTED BENEFITS:

- clear attributions, competences and expectations favor the processes of collection, analysis, interpretation and decision making to keep the Conecte SUS Program adherent to the needs of Health and the original purposes.

EXPECTATION OF COOPERATION:

Figure 78 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

1.2 FORMALIZE THE CONECTE SUS M&E OPERATION MODEL

Monitoring and guiding the execution of the Program are activities that must be carried out through a systematic process of collecting, analyzing and interpreting data that has adequate quality, scope and depth. Thus, this sub-priority will be achieved through the formalization of M&E processes and their formal attribution to the appropriate instances.

1.2.1 Formalize and Consolidate Conecte SUS M&E Processes

The M&E process generates knowledge and insights that support decision making for the execution of Conecte SUS. The results of M&E, the accumulated knowledge and the resulting recommendations should be made widely available to all relevant ESD stakeholders through periodic reports. The initial M&E model comprises four dimensions that represent the expectations around Conecte SUS, namely:

- Goals of Conecte SUS – the most relevant and priority indicators are those that allow comparing the evolution of Conecte SUS, RNDS and the Informatics of Primary Care with the formal goals defined in the creation of the program.
- Operational Efficiency and Effectiveness – tries to measure the quality and volume of data generated and used in EAS using the RNDS enabling structure.
- Digital Maturity of the EAS – seeks to objectively assess the preparation of the EAS to make appropriate use of the data and thus actively participate in the RNDS and the RAS.
- Population Health Indicators – seek to evaluate population health indicators that will be extracted from the RNDS and presented through the Conecte SUS Portal, in the Manager Profile.

The activities to be carried out include defining the instances responsible for the following processes, which should also be described in detail:

- proposition of result indicators and goals in line with the M&E model;
- proposition of goals, phases and deadlines;
- capturing, compiling, analyzing, interpreting and qualifying data to calculate indicators and report them to the M&E management instance;
- preparation of report with individual and consolidated analysis, with the analysis of the indicators, according to defined processes, schedules, models and tools;
- monitoring systematic data collection and reporting to higher bodies the difficulties encountered or opportunities for improvement.

The activities that form the scope of the formalization of the Monitoring and Evaluation Operation Model for the Conecte SUS started in 2020. The estimated time for carrying out this action throughout the ESD is illustrated in Figure 79.

Figure 79 – Estimated time to perform this action



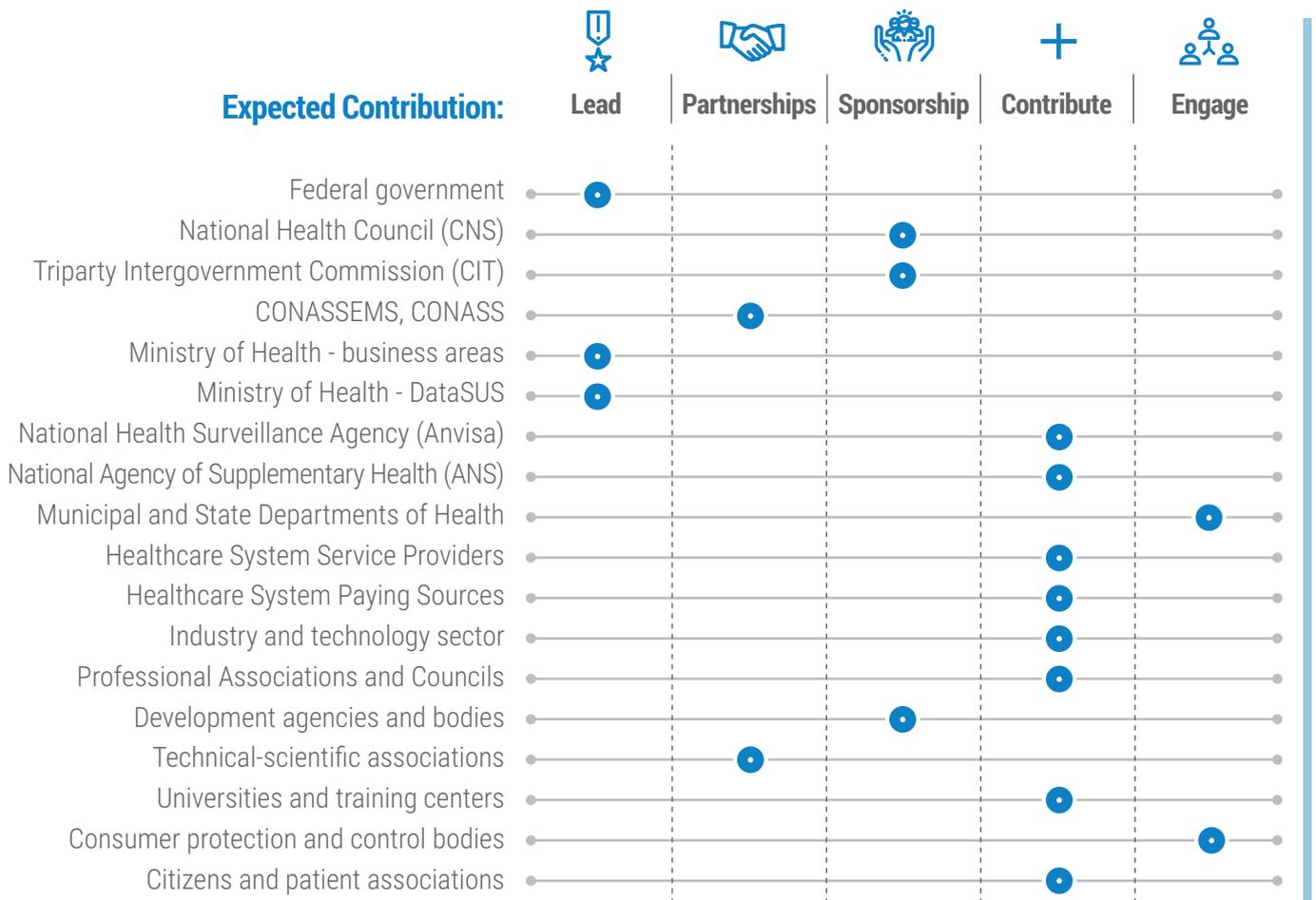
Source: own preparation.

EXPECTED BENEFITS:

- clear attributions, competences and expectations that favor the processes of collection, analysis, interpretation and decision making to keep the Conecte SUS Program adherent to the needs of Health and the original purposes.

EXPECTATION OF COOPERATION:

Figure 80 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

Priority 2: Establishment of the M&E model for collaboration

The success of ESD28 is closely associated with the success of the Collaborative Space in Digital Health. Thus, the ESD M&E process should systematically focus on understanding, monitoring, evaluating and making decisions that ensure the collaboration remains effective, efficient and oriented towards the Digital Health Vision.

Thus, this priority is intended to establish the governance and Monitoring and Evaluation processes of the ESD Collaborative Space. Defining the governance of these processes is an action that must be led by DataSUS/MS and must be inclusive to lead to effective, responsible, ethical and legally secure collaboration.

The Collaboration M&E governance model is similar, but it is not identical to that of Conecte SUS, mainly due to the need for a balance between government authority and the need to build consensus. This model must meet three levels:

Strategic: paying attention to the vision of Digital Health as a means to achieve healthcare system goals and offer strategic recommendations so that collaboration is effective and result-oriented, responding to new needs and capturing emerging opportunities.

Tactical: responsible for managing the execution of the M&E Plan, in alignment with the ESD, and also responsible for providing data collection, compilation, analysis, interpretation, understanding, extracting insights and knowledge, taking the necessary inputs to the strategic level so that there is a qualitative and quantitative objective assessment of the Action Plan development.

Operacional: acts directly in the activities necessary for the execution of the Monitoring and Evaluation Plan. At this level, the calculation of indicators involves activities of data collection,

qualification and analysis, as well as the calculation and interpretation of each indicator and classes of indicators. The generation of each class of indicators must have a management structure, capable of coordinating and monitoring the actions developed and reporting the results to the ESD management structures.

The expected benefits for citizens and the Brazilian healthcare system are:

- Efficient, effective and efficacious Conecte SUS Monitoring and Evaluation process;
- Conecte SUS adherent to health needs, attentive and focused on the proper use of new technologies;
- directed to respond to emergency needs, when necessary;
- prepared to take advantage of opportunities of public interest;
- synergy between needs and efforts;
- ensuring an adequate cost-benefit ratio.

2.1 ESTABLISH M&E GOVERNANCE FOR COLLABORATION

This priority seeks to identify the governance bodies of the Monitoring and Evaluation process for collaborative efforts, which is one of the foundations of ESD28. The diversity of stakeholders that characterizes collaboration must also be reflected in its governance. The leadership of the Ministry of Health and intersectoral actions are essential for the success of collaboration and, by extension, of M&E governance.

2.1.1 Establish M&E Governance instances for Collaboration

This action aims to identify and establish the instances used in the M&E processes of collaborative efforts, at the strategic level, while also offering a look at the permanent expansion of the Digital Health Strategy.

The instances to be formalized can be defined as:

- Sponsorship of the Collaborative M&E Plan – allows the M&E Plan to be valued as an essential instrument to guarantee the success of the Collaboration Space.

- Supervision and Strategic Management of Collaborative M&E – provides guidance and contribution to the definition of indicators, targets and monitoring processes, reviews and approves corrective or improvement recommendations.
- Management of the Execution of the M&E Processes in the Collaborative Space – allows the Collaborative M&E Plan to be executed satisfactorily, adequately guiding the execution of the collaboration efforts, keeping them in line with the ESD objectives.

Among the activities to be developed the following can be mentioned:

- identification of relevant stakeholders for each instance;
- preparation of the attribution and competence documents;
- formalization and publication of decisions through appropriate instruments.

The estimated time to carry out the activities that form the scope of the Establishment of the Governance Instances for M&E in the Collaborative Space is illustrated in Figure 81.

Figure 81 – Estimated time to perform this action



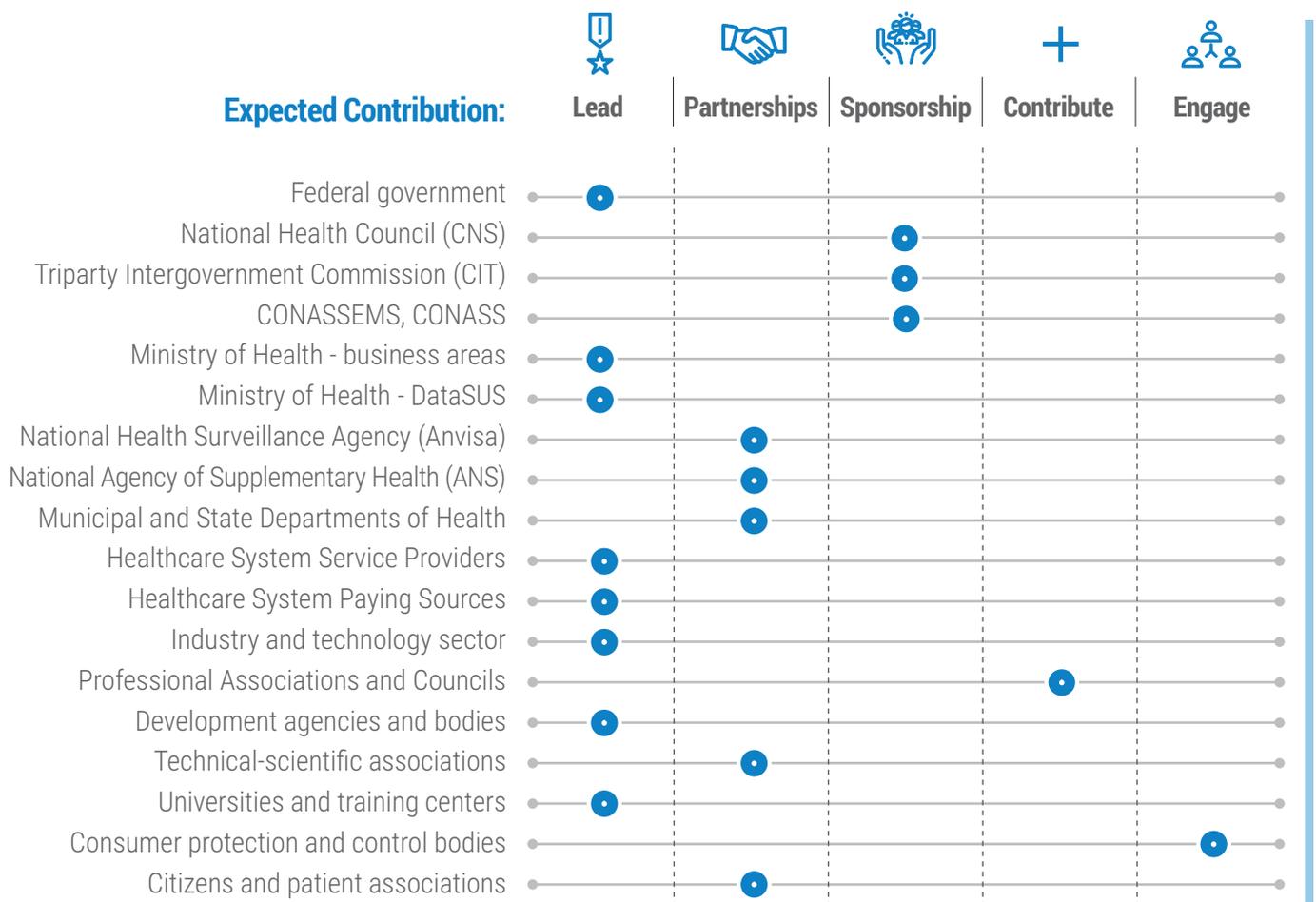
Source: own preparation.

EXPECTED BENEFITS:

- the clear attribution of expectations, roles and responsibilities among the participants in the Collaboration Space offers legal certainty and makes the Monitoring and Evaluation process lead to quality insights and more secure and evidence-based decision making.

EXPECTATION OF COOPERATION:

Figure 82 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

2.2 ESTABLISH THE M&E OPERATION MODEL, BY PRIORITY

Monitoring and guiding the execution of the Action Plan and Collaborative actions are activities that must be carried out through a systematic process of collecting, analyzing and interpreting data that has adequate quality, scope and depth. This sub-priority will be achieved through the formalization of M&E processes and their formal attribution to the appropriate instances.

2.2.1 Establish M&E Processes for each Priority

The Collaborative M&E process is aimed at ensuring that Collaboration is effective and guided by the Digital Health Vision. The results of the analyses, the accumulated knowledge and the resulting recommendations should be made widely available to all relevant ESD stakeholders through periodic reports.

The great challenge of this action is to identify the metrics that will make it possible to assess not only whether the collaboration as a whole is being productive, but also to analyze whether the collaboration has been effective in supporting the actions of each of the seven priorities of the Action Plan.

The activities to be carried out include defining the instances responsible for the following processes, which should also be described in detail:

- proposition of result indicators and goals in line with M&E;
- proposition of goals, phases and deadlines for collaboration, with goals for each priority;
- capturing, compiling, analyzing, interpreting and qualifying data to calculate indicators and report them to the M&E management instance;
- preparation of report with individual and consolidated analysis, with the analysis of the indicators, according to defined processes, schedules, models and tools;
- monitoring systematic data collection and reporting to higher instances the difficulties encountered or opportunities for improvement.

The estimated time for carrying out the activities of Establishment of M&E Processes, by priority, is illustrated in Figure 83.

Figure 83 – Estimated time to perform this action



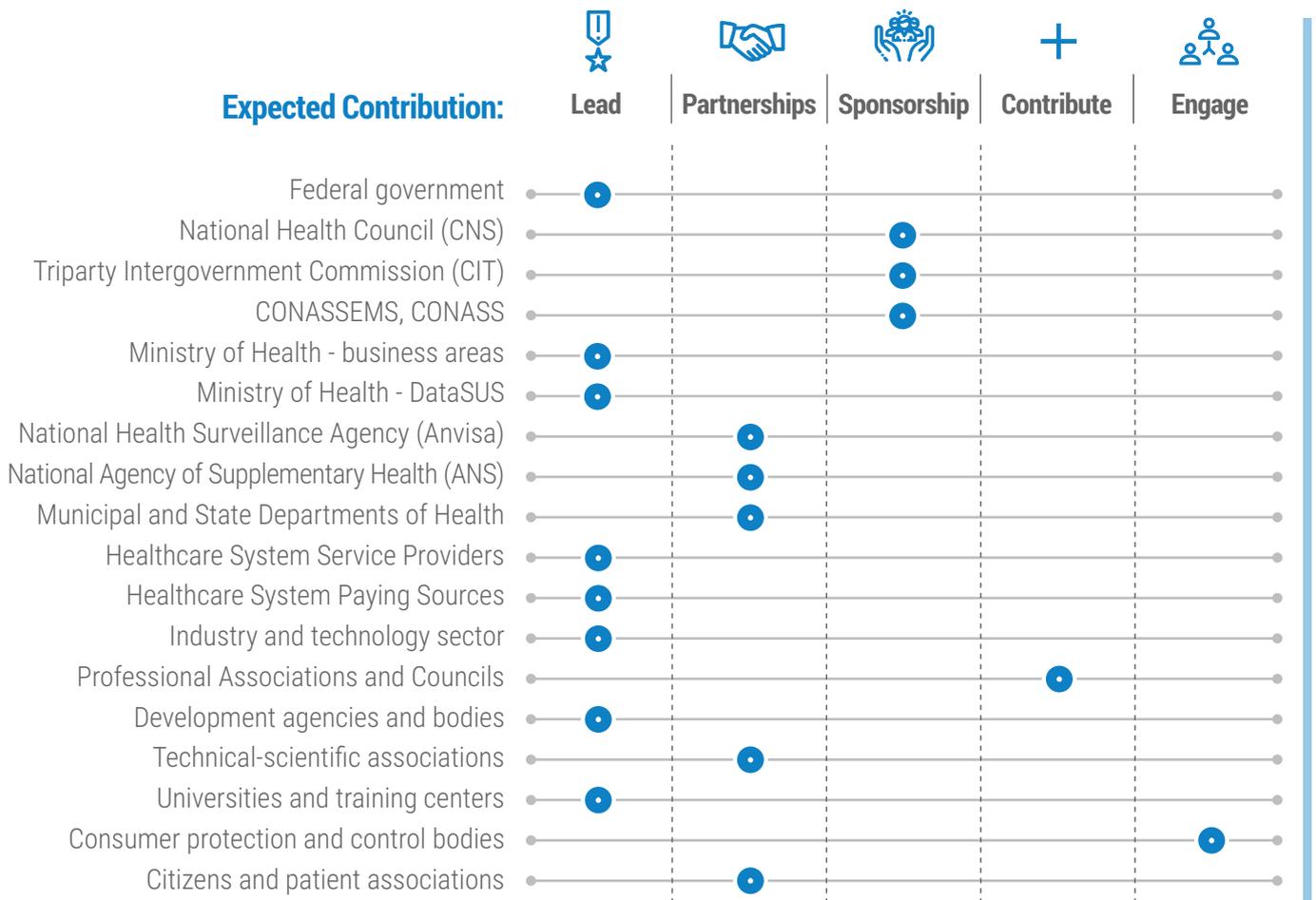
Source: own preparation.

EXPECTED BENEFITS:

- a clear and consensual definition of the processes that make up the Monitoring and Evaluation cycle of collaborative efforts is essential to obtain quality insights and secure and evidence-based decision making.

EXPECTATION OF COOPERATION:

Figure 84 – Stakeholder participation expectation to accomplish this action



Source: own preparation.

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