

The level of maturity in telehealth services in Mexico: Report of the survey applied to state telemedicine coordinations

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Abstract

After the COVID-19 pandemic with the identification of some structural obstacles in the use of telehealth in institutions, the need to identify strategies that allow telemedicine projects and programs to be implemented with less difficulty was noted. **Objective:** Identify the level of maturity in telehealth services in Mexico, through the development and implementation of an instrument that evaluates this general situational diagnosis in the Telemedicine Coordinations in the Federal entities of Mexico. **Methodology:** This work had 2 main stages related to the construction of the questionnaire: (1) planning; (2) preparation of questions by category. After completing the construction, stage (3) application of the form was carried out. **Results:** Of the 32 Federal Entities (FE) in Mexico that were part of this analysis, 94% (30 EF) answered the form, while the remaining 6% (2 EF) did not do so. **Discussion and conclusion:** Based on the analysis of the results obtained through the application of the questionnaire, it is possible to debate the general diagnosis of the Telemedicine Coordinations in the same State Health Secretariats. In this way, the analysis of the discussed results can serve as a theoretical and methodological.

Keywords: Telehealth, Telemedicine, Maturity of services, Situational diagnosis, Mexico, Telemedicine Coordinations, Health policies

Resumen

Nivel de madurez en los servicios de telesalud en México: Encuesta a coordinaciones estatales de telemedicina
Luego de la pandemia de COVID-19 con la identificación de algunos obstáculos estructurales en el uso de la telesalud en las instituciones, se observó la necesidad de identificar estrategias que permitan implementar proyectos y programas de telemedicina con menor dificultad. **Objetivo:** Identificar el nivel de madurez en los servicios de telesalud en México, a través del desarrollo e implementación de un instrumento que evalúe este diagnóstico situacional general en las Coordinaciones de Telemedicina en las entidades Federativas de México. **Metodología:** Este trabajo contó con 2 etapas principales relacionadas con la construcción del cuestionario: (1) planificación; (2) elaboración de las preguntas por categoría. Después de finalizar la construcción, se realizó la etapa de (3) aplicación del formulario. **Resultados:** De las 32 Entidades Federativas (EF) en México que fueron parte de este análisis, el 94% (30 EF) contestó el formulario, mientras que del 6% (2 EF) restante no lo hicieron. **Discusión y conclusión:** A partir del análisis de los resultados obtenidos mediante la aplicación del cuestionario se puede debatir sobre el diagnóstico general de las Coordinaciones de Telemedicina en las mismas Secretarías de Salud Estatales. De esta manera, el análisis de los resultados discutidos puede servir como base teórica y metodológica para.

Palabras-clave: Telesalud, Telemedicina, Madurez de servicios, Diagnóstico situacional, México, Coordinaciones de Telemedicina, Políticas de salud

Resumo

Nível de maturidade dos serviços de telessaúde no México: Pesquisa com coordenações estaduais de telemedicina

Após a pandemia de COVID-19 com a identificação de alguns obstáculos estruturais na utilização da telessaúde nas instituições, observou-se a necessidade de identificar estratégias que permitam que projetos e programas de telemedicina sejam implementados com menos dificuldade. **Objetivo:** Identificar o nível de maturidade nos serviços de telessaúde no México, através do desenvolvimento e implementação de um instrumento que avalie este diagnóstico situacional geral nas Coordenações de Telemedicina nas entidades federais do México. **Metodologia:** Este trabalho teve 2 etapas principais relacionadas à construção do questionário: (1) planejamento; (2) elaboração de questões por categoria. Após a conclusão da construção foi realizada a etapa (3) de aplicação do formulário. **Resultados:** Das 32 Entidades Federais (FE) do México que fizeram parte desta análise, 94% (30 EF) responderam ao formulário, enquanto os restantes 6% (2 EF) não o fizeram. **Discussão e conclusão:** A partir da análise dos resultados obtidos através da aplicação do questionário é possível debater o diagnóstico geral das Coordenadorias de Telemedicina nas mesmas Secretarias Estaduais de Saúde. Desta forma, a análise dos resultados discutidos pode servir de base teórica e metodológica.

Palavras-chave: Telessaúde, Telemedicina, Maturidade dos serviços, Diagnóstico situacional, México, Coordenações de Telemedicina, Políticas de saúde.

INTRODUCTION

In Mexico, public and private health institutions use technological tools more frequently to provide remote care. Medical personnel and health professionals in general use these tools mainly to stay in contact with users and patients and to exchange information.

Telemedicine increased considerably with the arrival of the SARS-COV-2 virus pandemic, which causes COVID-19 disease. However, after this health emergency, remote care statistics decreased; although the number of actions remains high compared to the services that institutions provided before COVID-19.

However, not all health institutions were prepared for telemedicine or telehealth, just as not all institutions have been able to optimize and use the installed technological infrastructure that allows for improved access to medical care using information technologies. It was identified that the institutions had work groups or coordination with very different management capacities, which did not allow them to establish strategies to deal with the changes produced by both the pandemic and those adjustments derived from technological innovation and the new forms of communication and relationships that are carried out in current health systems.

Therefore, it is of utmost importance to identify strategies that allow the implementation of telemedicine projects and programs with less difficulty, establish minimum necessary characteristics and capacities, and desirable scenarios to have similar visions in the different telehealth coordination of the public institutions of the sector.

The growth in the number of telemedicine and telehealth actions to provide health services is notable. New coordination, heads, and directorates of telemedicine, telehealth, and digital health are also identified in health organizations¹⁶. The latter gradually allows this discipline to be projected in the short term as an activity inherent to health care in the country. Therefore, it is important to direct efforts not only in technical issues of implementation, but also to strengthen the areas of human resources, administration, finance and, above all, adequate governance that allows for sustained and long-term growth of programs that implement digital health and remote care actions.

Therefore, the general objective of this text is to identify the level of maturity in Telehealth services in Mexico, through the development and implementation of an instrument that evaluates this general situational

diagnosis in the Telemedicine Coordination in the Federal Entities of Mexico.

The specific objectives can be described as follows:

1. To obtain information on the initial elements in organizational management to implement telehealth services.
2. To identify the knowledge of standards and procedures to be considered to develop telehealth services.
3. To describe the digital environment and technological infrastructure necessary (technological and collaborative components) to provide telehealth services.
4. To identify the knowledge of procedures and functions to implement and develop telehealth services.
5. To determine the use of human resources in medical and technological areas of the institution to implement and develop telehealth services.

METHODOLOGY

It was identified that there is a high level of heterogeneity in the level of maturity in the telemedicine and telehealth coordination of the Health Secretariats of the federal entities in the country. This is due to the disparity of knowledge and organizational, technological, human, management, and regulatory skills, in the remote healthcare services context.

To understand the level of organizational maturity of telehealth coordination, we rely on different sources of information from various institutions that have developed similar tools, such as the World Health Organization/Pan American Health Organization (WHO/PAHO)^{1,2,5,6,7,8,9,10,11,12,18,19,20}, the Organization for Economic Cooperation and Development (OECD)^{13,14,15} the National Council for the Evaluation of Social Development Policy (CONEVAL)⁴; and other guiding documents from different Ministries of Health in Latin America and Europe^{3,17}.



Based on the analysis of the different measurement models, the “*Questionnaire for the Creation of the Diagnostic Tool in Telehealth*” was developed, in which the profiles of the people involved who will participate in answering the questions of the instrument were defined. Thus, 5 categories or items of the “maturity” of telemedicine and telehealth coordination were identified. Twenty-seven questions were developed to allow multiple-choice responses, checkboxes, and open responses. Finally, the response options of the questionnaire were logically adapted to quantitatively identify the degree of maturity in each of the categories or items of the instrument.

The 27 questions developed in the questionnaire were incorporated through an online form using the Google Forms tool, which was shared with the people responsible for the Telemedicine and Telehealth Coordination/Department to integrate the information of all the people involved that they consider necessary for the collection of data to be in a position to answer the survey.

Questionnaire construction: planning

Category Identification

To identify different relevant aspects that *Questionnaire for the Creation of the Telehealth Diagnostic Tool* could provide, and as a result of the research obtained from different measurement

models, 5 main categories were established for its development:

1. Organizational Basis
2. Regulatory Aspects
3. Technological ecosystem
4. Process Management
5. Human Resources

Each category, as a central part of the questionnaire, have a series of questions focused on obtaining information that allows for an analysis to determine the level of maturity of the Telehealth Coordination.

Question development

The questions, in all their categories, were appropriate to identify a current and specific context of their level of maturity in the development of telemedicine and telehealth projects in the state of Health Services in Mexico.

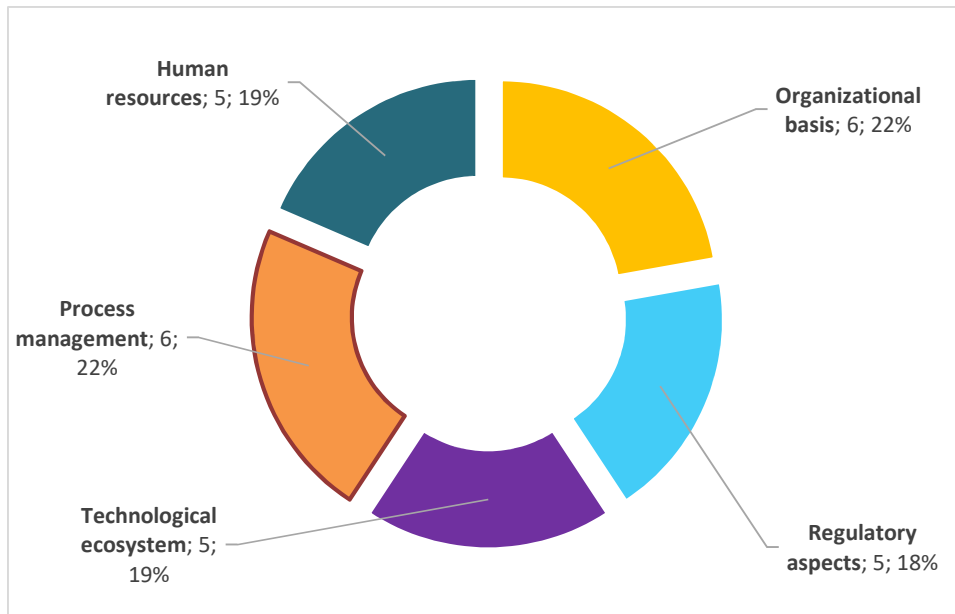
Through the analysis of different qualitative and quantitative aspects, an online form was designed which consisted of a questionnaire with 27 questions divided into the 5 categories mentioned above. (Table 1)

Table 1 - Question development: quantitative distribution of categories and their description

Category	Question number	Quantity of questions	Description
Organizational basis	Questions 1 to 6	6 questions	Initial elements in organizational management to implement telehealth services.
Regulatory Aspects	Questions 7 to 11	5 questions	Identification of standards and procedures to be considered to develop telehealth services.
Technological Ecosystem	Questions 12 to 16	5 questions	Digital environment and necessary technological infrastructure. It includes technological and collaborative components to provide telehealth services.
Process Management	Questions 17 to 22	6 questions	Set of procedures and functions to implement and develop telehealth services.
Human Resources	Questions 23 to 27	5 questions	Human resources in the medical and technological areas are available to the institution to implement and develop telehealth services.

*Source: Author's table. Questionnaire for the creation of Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordination/Department of State Health Secretariats in Mexico.

Figure 1 - Question development: percentage distribution of categories



*Source: Author's work. Questionnaire for the creation of Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordination/Departments of State Health Secretariats in Mexico.

Developing response options

They are designed based on the context of each question, so there are different types of responses that allow the person surveyed to be more assertive when answering them.

The types of responses that exist in the questionnaire are:

I. Multiple choice: limited to choosing only one of the options offered in the response.

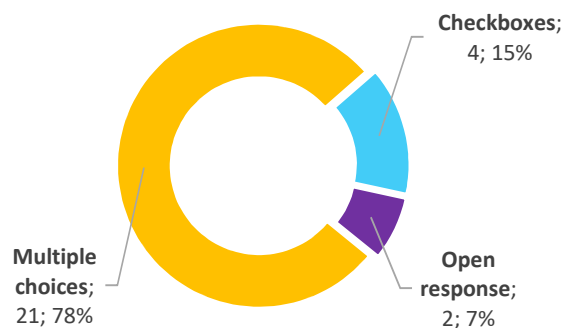
- o In some cases, the "Other" option was added; it allows the participant to specifically describe the response, considering that, according to the context of the question, it may be necessary to openly describe their response.

- o Based on different types of Likert scale; it allows the degree of completion, commitment or execution to be measured, according to the question asked.

II. Checkboxes: it allows to select several responses from a list of options.

III. Open response: it allows to prepare of responses with free text and in an open manner.

Figure 2 - Response development: percentage distribution on the format type



*Source: Author's work. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordination/Departments of State Health Secretariats in Mexico.

Questionnaire for the creation of the Telehealth Diagnostic Tool: detailed development by category

Category "Organizational Basis"

The objective is for the person surveyed to identify the initial elements regarding organizational management to implement telehealth services (Table 3).



Table 3 - Questionnaire: Category “Organizational Basis”

Question	Question type	Responses
1. Is there a specific coordination of telemedicine in the state?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • It exists in the organizational structure and is formalized • It exists and is formalized but is not found in the organizational structure • It is not formalized and is not found in the organizational structure • It is located within a responsible area, it is not formalized and it is not found in the organizational structure. • There is no coordination
2. What type of project are you currently working on?	Checkbox question (it allows to select multiple answers from a list of options).	<ul style="list-style-type: none"> • Current Project • Current program • Actions under the coordination of the Telehealth area • Isolated actions that are not in charge of the Telehealth area • Nothing
3. Do you think that the State Health Secretariat plans to implement a telehealth project?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • A project is currently being implemented • Early 2023 • Mid 2023 • In 2024 • Its implementation is not planned
4. Which areas or programs do you collaborate for coordination in the State Health Services? (Example: 2nd level, teaching, specific care programs, etc.)	Question to be answered openly, allowing the respondent to elaborate his or her free and open response.	<ul style="list-style-type: none"> • Open response.
5. Does the coordination have a budget?	Checkbox question (it allows to select multiple answers from a list of options).	<ul style="list-style-type: none"> • Assigned / Current expenditure • Federal investment • By agreement • By donation • No budget available
6. Does the coordination have a specific infrastructure? *It refers to Central Level.	Multiple choice question (limited to choosing only one of the different options offered in the answer). Likert scale: Frequency of carrying out tasks and actions or occurrence of events.	<ul style="list-style-type: none"> • Always • Usually • Occasionally • Rarely • Never

*Source: Author's table. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

Category “Regulatory aspects”

In this category, the objective is for the person consulted to identify the use and knowledge of different standards and procedures to be considered to develop telehealth services (Table 4).

Table 4 - Questionnaire: Category “Regulatory aspects”

Question	Type of question	Responses
7. What area does the Telehealth Coordination or Department depend on?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Medical Care • Planning • IT • Teaching • Ministry of Health (directly) • Other
8. Current position of the person in charge of whom you report?	Question to be answered openly, to allow the person surveyed to	<ul style="list-style-type: none"> • Open response.

	elaborate his or her response in a free and open manner.	
9. Is there a strategic plan? * This refers to the Telehealth Coordination.	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Documented annual strategic planning • Undocumented annual strategic planning • Roadmap of activities • General action plan • None
10. Does the coordination engage in privacy and information security practices?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • It trains • It disseminates • It generates campaigns • It does not participate.
11. Are there formal procedures for obtaining informed consent and privacy notice from patients remotely?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)

*Source: Author's table. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordination/Departments of State Health Secretariats in Mexico.

Category “Technological ecosystem”

Thus, the section on the technological ecosystem seeks the person consulted to describe the digital environment and the necessary technological infrastructure, which includes different technological and collaborative components to provide telehealth services (Table 5).

Table 5 - Questionnaire: Category “Technological ecosystem”

Question	Type of question	Responses
12. Does the coordination have specific technology? * It refers to Telehealth.	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Always • Usually • Occasionally • Rarely • Never
13. Is there an annual maintenance program for technological equipment?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Yes, it exists and is being implemented • Yes, it exists, but it is not implemented 100% • Yes, it exists, but it is not implemented • It does not exist, but it is being considered • It does not exist
14. Is there an inventory of the technological equipment used in telehealth services?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Yes, it exists and is up to date • Yes, it exists, but is not up to date • Basic list • Incomplete list • No inventory available
15. Do you have the technological and collaborative components necessary to implement telehealth projects?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)
16. Is there an electronic patient record information system in telemedicine?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Electronic medical record • Clinical information system for telemedicine • Medical note/sheet software • None • Other

*Source: Author's table. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordination/Departments of State Health Secretariats in Mexico.

Category “Process management”

In this section, the person surveyed describes the set of procedures and functions to implement and develop telehealth services (Table 6).



Table 6 – Questionnaire: Category “Process management”

Question	Type of question	Responses
17. Does the coordination have specific organizational manuals?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Always • Usually • Occasionally • Rarely • Never
18. Is there a risk management or contingency plan for the telehealth service?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Totally agree • Agree • Indifferent • Disagree • Totally disagree
19. Are there procedures to communicate and document possible technical failures during care provided through telehealth service?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)
20. Are there formal procedures to ensure the security, confidentiality, and responsibilities associated with telemedicine services generated during the provision of telemedicine services?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)
21. Are there periodic evaluations to determine the level of satisfaction of the patient treated via telehealth?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)
22. Are there different indicators for measuring the actions carried out in telemedicine?	Checkbox question (allows you to select multiple answers from a list of options).	<ul style="list-style-type: none"> • Effectiveness indicators • Quality indicators • Efficiency indicators • Productivity indicators • Other

*Source: Author’s table. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

Category “Human Resources”

Finally, in the Human Resources section, the person consulted identifies the basic elements regarding organizational management to mplement telehealth services; the questions are focused on the following questions (Table 7).

Table 7 – Questionnaire: Category “Human Resources”

Question	Type of question	Responses
23. How many staff does the coordination have?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • More than 8 people under my care • Between 5 and 8 people under my care • Between 2 and 4 people under my care • Only one person under my care • No one under my care

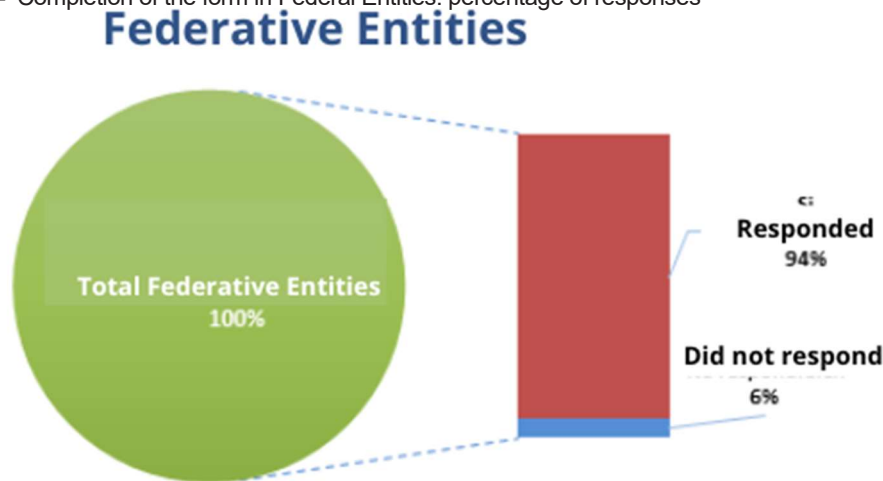
24. Is the coordination staff trained in telehealth?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)
25. Does the coordination carry out training actions for health personnel?	Checkbox question (allows you to select multiple answers from a list of options).	<ul style="list-style-type: none"> • Physician • Nursing • IT • Administrative
26. Do you have enough health personnel to offer telehealth services?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)
27. Is technical support available to resolve issues related to the technology used in the telehealth service?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely • Enough • Partially • Not enough • A little (or nothing)

**Source: Author's table. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

RESULTS

Of the 32 Federal Entities (FE) that were part of this analysis, 94% (30 EF) answered the form, while the remaining 6% (2 EF) did not (Figure 3).

Figure 3- Completion of the form in Federal Entities: percentage of responses



*Source: Author's table. Questionnaire for the creation of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

Regarding the categories, the results of the responses of the people surveyed are presented in Tables 8, 9, 10, 11, and 12.

Table 8 - Category Organizational Bases: Collected Responses

Question	Question type	Answers	Percentage of reach
1. Is there a telemedicine coordination in the state?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • It exists in the organizational structure and is formalized (36%) • It exists and is formalized but is not found in the organizational structure (17%) • It is not formalized and is not found in the organizational structure (7%) • It is found within a responsible area, is not formalized and is not found in the organizational structure (37%) • There is no coordination (3%) 	100%
2. What type of project are you currently working on?	Checkbox question (it allows to select multiple answers from a list of options).	<ul style="list-style-type: none"> ▪ Isolated actions that are not in charge of the Telehealth area (14%) ▪ Current project. 	100%



		<ul style="list-style-type: none"> • Actions under the coordination of the Telehealth area (23%) • Actions under the coordination of the Telehealth area. Isolated actions that are not in charge of the Telehealth area (4%) <ul style="list-style-type: none"> ▪ Nothing (10%) • Project not in force (20%) • Project in force. Actions under the coordination of the Telehealth area (3%) • Project not in force (20%) • Project in force. Actions under the coordination of the Telehealth area (3%) • Project in force. Project in force (47%) 	
3. Do you think that the State Health Secretariat plans to implement a Telehealth project?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • A project is currently being implemented (47%) • Early 2023 (3%) • Mid 2023 (23%) • In 2024 (17%) • Not aware of its implementation (10%) 	100%
4. Which areas or programs do you collaborate for coordination in the State Health Services (Example: 2nd level, teaching, specific care programs, etc.)	Open-ended question (where the respondent can write his or her answer freely and in a structured manner).	Varied answers (-)	-
5. Does the coordination have a budget?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Assigned / Current expenditure (17%) • Assigned / Current expenditure, Federal investment (6%) • Assigned / Current expenditure. No budget available (3%) • Federal investment (7%) • No budget available (67%) 	100%
6. Does the coordination have specific infrastructure? *About to the central level.	Likert Scale: Frequency of completion of tasks and actions or occurrence of events.	<ul style="list-style-type: none"> • Always (36%) • Almost always (17%) • Occasionally (10%) • Almost never (10%) • Never (27%) 	100%

*Source: Figure created by the author. Questionnaire for the development of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico

Table 9 - Category Regulatory Aspects: Collected Responses

Question	Question type	Answers	Percentage of reach
7. What area does the Telehealth Coordination or Department depend on?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Medical Care (27%) • Planning (17%) • IT (7%) • Teaching (10%) • Ministry of Health (directly) (10%) • Other (29%) 	100%
8. Current position of the person in charge of whom you report?	Question to be answered openly, allowing the person surveyed to elaborate his or her response freely and openly.	• Varied answers	
9. Is there a strategic plan? This refers to the Telehealth Coordination.	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Documented annual strategic planning (33%) • Undocumented annual strategic planning (13%) • Roadmap of activities (0%) • General action plan (34%) • None (20%) 	100%
10. Does the coordination engage in privacy and information security practices?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Trains (13%) • Disseminates (23%) • Makes recommendations (34%) • Generates campaigns (0%) • Does not apply (30%) 	100%
11. Are there formal procedures to ensure that informed consent and privacy notice	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (40%) • Sufficient (4%) • Partially (20%) • Insufficient (6%) 	97%

are obtained from patients remotely?	• Very little or not at all (27%)
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*Source: Figure created by the author. Questionnaire for the development of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

Table 10 - Category Technological Ecosystem: Collected Responses

Question	Question type	Answers	Percentage of reach
12. Does the coordination have specific technology? *About Telehealth.	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Always (30%) • Almost always (13%) • Occasionally (30%) • Rarely (10%) • Never (17%) 	100%
13. Is there an annual maintenance program for technological equipment?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Yes, it exists and is being implemented (20%) • Yes, it exists, but it is not being implemented 100% (10%) • Yes, it exists, but it is not being implemented (0%) • Yes, it exists, but it is being considered (40%) • It does not exist (30%) 	100%
14. Is there an inventory of the technological equipment used in telehealth services?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Yes, it exists and is up to date (50%) • Yes, it exists, but it is not up to date (10%) • Basic list (13%) • Incomplete list (0%) • No inventory available (27%) 	100%
15. Do you have the necessary technological and collaborative speakers to implement telehealth projects?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (20%) • Sufficient (10%) • Partially (23%) • Insufficient (27%) • Very little (or not at all) (20%) 	100%
16. Is there an electronic patient record information system in telemedicine?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Electronic medical record (28%) • Clinical information system for telemedicine (7%) • Medical sheet/note software (17%) • None (35%) • Other (13%) 	100%

*Source: Figure created by the author. Questionnaire for the development of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

Table 11 - Category Process Management: Collected Answers

Question	Question type	Answers	Percentage of reach
17. Does the coordination have specific organizational manuals?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (23%) • Sufficient (14%) • Partially (23%) • Insufficient (3%) • Very little (or not at all) (37%) 	100%
18. Is there a risk management or contingency plan for the telehealth service?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Totally agree (13%) • Agree (23%) • Indifferent (27%) • Totally disagree (20%) 	100%
19. Are there procedures in place to communicate and document possible technical failures during care provided via a telehealth service?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (20%) • Sufficient (20%) • Partially (17%) • Insufficient (7%) • Very little (or not at all) (36%) 	100%
20. Are there formal procedures to ensure the security, confidentiality,	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (30%) • Sufficient (20%) • Partially (13%) • Insufficient (10%) 	100%

and protection of data in telehealth services generated during telemedicine services?		<ul style="list-style-type: none"> • Very little or not at all (27%) 	
21. Are there periodic evaluations to determine the level of satisfaction of patients treated via telehealth?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (7%) • Sufficient (7%) • Partially (17%) • Insufficient (13%) • Very little or not at all (56%) 	100%
22. Are there different indicators for measuring the actions carried out in telemedicine?	Checkbox question (allows to select multiple answers from a list of options).	<ul style="list-style-type: none"> • Efficiency indicators (4%) • Effectiveness indicators • Quality indicators • Efficiency indicators (10%) • Productivity indicators • Efficiency indicators (7%) • Productivity indicators • Efficiency indicators (3%) • Efficiency indicators (3%) • Productivity indicators • Productivity indicators (47%) • Other (22%) 	100%

*Source: Figure created by the author. Questionnaire for the development of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

Table 12 - Human Resources Category: Collected Responses

Question	Question type	Answers	Percentage of reach
23. How many staff does the coordination have?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • More than 8 people under my charge (10%) • Between 5 and 8 people under my charge (7%) • Between 2 and 4 people under my charge (30%) • Only one person under my charge (20%) • No one person under my charge (33%) 	100%
24. Is the coordination staff trained in telehealth?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (20%) • Sufficient (30%) • Partially (27%) • Insufficient (0%) • Very little (or not at all) (23%) 	100%
25. Does the coordination carry out training actions for health personnel?	Checkbox question (allows you to select multiple answers from a list of options).	<ul style="list-style-type: none"> • Administrative (20%) • IT (10%) • IT, Administrative (7%) • Medical (23%) • Medical, Nursing (7%) • Medical, Nursing, Administrative (3%) • Medical, Nursing, IT (3%) • Medical, Nursing, IT, Administrative (27%) 	100%
26. Do you have enough health personnel to offer telehealth services?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (10%) • Sufficient (13%) • Partially (27%) • Insufficient (33%) • Very little (or not at all) (17%) 	100%
27. Is technical support available to resolve issues related to the technology used in the telehealth service?	Multiple choice question (limited to choosing only one of the different options offered in the answer).	<ul style="list-style-type: none"> • Completely (27%) • Sufficient (27%) • Partially (13%) • Insufficient (23%) • Very little (or not at all) (10%) 	100%

*Source: Figure created by the author. Questionnaire for the development of the Telehealth Diagnostic Tool in Telemedicine and Telehealth Coordinations/Departments of State Health Secretariats in Mexico.

DISCUSSION AND CONCLUSION

The general level of maturity in telemedicine coordination in State Health Services is very heterogeneous. This is a normal result due to the disparity in the knowledge, skills, resources, and policies adopted in the different organizations. The vast majority have Telehealth coordination without being within a formal organizational structure. Despite this, strong collaboration and coordination with other medical and administrative areas allow participation in health programs and projects.

A close relationship with the areas of medical care is identified, as well as a strong command of strategic planning, digital environment for daily activities, technological components, and information systems for electronic patient records. There are detailed inventories of the technology used. However, the vast majority report significant shortfalls in achieving specific actions to implement annual maintenance programs for technological equipment.

The lack of a budget for coordination is constant, even though most have specific and sufficient infrastructure in central coordination. A significant percentage is involved in privacy and information security issues, as well as in formal procedures for obtaining informed consent and privacy notices of patients treated remotely. Only 50% have adequate management of processes and procedures (organization manuals), risk management or contingency plans, and all those procedures to communicate and document possible technical failures, as well as formal procedures for responsibilities generated during telemedicine services.

Most of them do not have regular evaluations to determine the level of satisfaction of the person served through this type of service, even though they mention having indicators to measure the actions carried out. Another constant is the active participation of the coordinators in training and solving technical problems.

The information collected and its analysis allow to establish specific strategies that strengthen the capacity of the units in charge of implementing telehealth projects and programs in the State Health Services. In this way, the analysis of the results discussed can serve as a theoretical and methodological basis for their implementation in the future. Although achieving short-term homologation in such a heterogeneous environment is unlikely, greater coordination on specific issues can be generated with greater efficiency and coordinated actions can be established to improve the provision of Telehealth services and actions in the medical units of the State Health Secretariats.

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