18 years of collaboration in digital health and expansion for RUTE-AL

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Abstract

*Collaboration networks in scientific knowledge (RCC) have advanced significantly in the last 18 years and are currently a fundamental structure for the development of collaborative activities in the area of digital health, rendering them indispensable in the expansion and consolidation of telemedicine and telehealth actions in Brazil. **Objective**: Report the experience of digital health actions at RNP, with RCC, at RUTE in Brazil and its expansion to the Latin American region and Portuguese-speaking countries. **Results:** This study shows the evolution and expansion of the Rute network since its creation until 2023, also addressing the pandemic scenario in 2020. Furthermore, its expansion at an international level is described, including Latin American countries: Mexico, Ecuador, Colombia and Chile. This diversity of actors in networks is essential to strengthen the digital transformation of health in Latin America. **Conclusion:** It is expected that RUTE's experience and practices will stimulate the participation of new user organizations in the RNP System, that we will have more incorporations and collaborations in RUTE, innovative projects, new models of collaboration in the network.*

Palavras-chave: *Saúde Digital, Telehealth, Estratégias de eSaúde.*

Resumen

18 años de colaboración en salud digital y expansión para RUTE-AL.

*Las redes de colaboración en conocimientos científicos - RCC, avanzaron significativamente en los últimos 18 años y actualmente son una estructura fundamental para el desarrollo de actividades colaborativas en el área de salud digital, volviéndolas indispensable en la expansión y consolidación de las acciones de telemedicina y telesalud en Brasil. **Objetivo:** relatar la experiencia de acciones de salud digital en la RNP, con una RCC, la RUTE en Brasil y su expansión a la región de América Latina y a los países de lengua portuguesa. **Resultados:** Se muestra de manera amplia la evolución y expansión de la red Rute desde su creación hasta 2023, abordando también el escenario de pandemia en 2020. Además, se describe su expansión a nivel internacional, incluyendo países de América Latina: México, Ecuador, Colombia y Chile. La diversidad de actores que conforman los sistemas de salud y salud digital es fundamental para fortalecer la transformación digital de la salud en América Latina. **Conclusión:** Se espera que la experiencia y las prácticas de RUTE incentiven la participación de nuevas organizaciones usuarias en el Sistema RNP, que tengamos más adhesiones y colaboraciones en RUTE, proyectos innovadores, nuevos modelos de colaboración en red.*

Palabras-clave: *Salud Digital, Telesalud, Estrategias de eSalud*

Resumo

18 anos de colaboração em saúde digital e expansão para a RUTE-AL

*A s redes de colaboração no conhecimento científico (RCC) avançaram significativamente nos últimos 18 anos e atualmente são uma estrutura fundamental para o desenvolvimento de atividades colaborativas na área de saúde digital, tornando-as indispensáveis na expansão e consolidação das ações de telemedicina e telessaúde no Brasil. **Objetivo:** Relatar a experiência de ações digitais de saúde na RNP, com RCC, na RUTE no Brasil e sua expansão para a região latino-americana e países de língua portuguesa. **Resultados:** Este estudo mostra a evolução e expansão da rede Rute desde sua criação até 2023, abordando também o cenário pandêmico em 2020. Além disso, é descrita sua expansão em nível internacional, incluindo países latino-americanos: México, Equador, Colômbia e Chile. Essa diversidade dos atores nas redes é essencial para fortalecer a transformação digital da saúde na América Latina. **Conclusão:** Espera-se que a experiência e práticas da RUTE estimulem a participação de novas organizações usuárias no Sistema RNP, que tenhamos mais incorporações e colaborações na RUTE, projetos inovadores, novos modelos de colaboração na rede.*

Keywords: *Digital Health, Telessaúde, eHealth Strategies*

INTRODUCTION

In September 1989, the NREN National Research and Education Network (RNP-Red Nacional de Investigación e Enseñanza RCC)[11] was created to build a national Internet network infrastructure in the academic environment, as a project of the National Council for Scientific and Technological Development - CNPq (*Consejo Nacional de Desarrollo Científico y Tecnológico*), a network that currently reaches all units of the federation. Today, RNP is a company classified as a social organization linked to the Ministry of Science, Technology and Innovation (MCTI), which maintains it together with the Ministries of Education (MEC), Communication (MCom), Culture (MINC), Health (MS) and Defense (MD), which participate in the RNP Interministerial Program (PRO-RNP), with the probable expansion for the participation of the Ministry of Agriculture and Livestock (MAPA). All this recognition certifies RNP as the Brazilian network for science, technology, innovation, education, and research with the responsibility of providing a secure and high-capacity Internet infrastructure, in addition to providing services and promoting innovation projects for the entire RNP System, made up of User Organizations (UO) linked to higher education, research, and innovation. It includes universities, educational and cultural institutes, research agencies, health establishments with teaching activities, parks, and technological hubs so that RNP reaches 4 million Brazilian students, teachers and researchers.

The name of *Consejo Nacional de Desarrollo Científico y Tecnológico* (RNIE) comes from the English National Research and Education Network (NREN)[2]. Its infrastructure connects, through terrestrial and submarine fiber optic cables[3], with other NRENs in Latin America, North America, Africa, Europe, Asia and Oceania.

The RNP System has several components, such as the Ipê Network, points of presence, community networks, and Community Collaboration Networks (RCCs)[4]. RNP is responsible for promoting the creation, operation, and maintenance of RCCs, most of which are made up of groups of academic origin that are organized through coordinated communication to cooperate in areas of common interest, to generate alliances, stimulating innovation, facilitating virtual meetings and cooperation between researchers, in addition to promoting the generation of knowledge[1]. In January 2006, the University Telemedicine Network (RUTE)[5] was created, the first RCC, with the implementation of its units, first in university and teaching hospitals and then, in the last 18 years, it became a fundamental structure for the development of collaborative activities in the area of digital health, through special interest groups, a name that comes from the English Special Interest Group (SIG), for the

benefit of the expansion and consolidation of telemedicine and telehealth actions in Brazil[6,7,8,9].

Thus, this work aims to report the experience of digital health actions in RNP[1], with an RCC[4], the RUTE in Brazil, and its expansion to the Latin American region and Portuguese-speaking countries.

METHODOLOGY

This is an experience report. Initially, a broad set of official platforms and documents was selected to collect materials related to scientific knowledge collaboration networks: RNP, RUTE, and RCC. From this, these data were analyzed, described, and discussed to show the evolution and importance of scientific knowledge collaboration networks, especially RUTE, from its creation to its expansion in Latin America.

RESULTS AND DISCUSSION

RUTE Expansions

Figure 1 shows the RUTE timeline, from its creation to 2023. Some milestones can be identified there, such as the first live broadcast of 4 surgeries, performed in December 2013, in real-time, simultaneously, and in high definition (4K) to San Diego, CA, USA, promoted by RNP, directly from Brazil to the United States. The School of Dentistry of the University of São Paulo (USP) and the federal university hospitals of Rio Grande do Sul (HCPA/UFRGS), Espírito Santo (HUCAM/UFES) and Rio Grande do Norte (HUOL/UFRN) were responsible for the procedures[10].

Another milestone in terms of international collaboration was the creation of the permanent Working Group (WG) of the Community of Portuguese Speaking Countries (CPLP) on Telemedicine and Telehealth in 2017[11], , which also had its milestones, such as the creation of the National Telehealth Program of Mozambique in 2018 and the creation of the CPLP Cytotechnology SIG, in 2021, coordinated by the José Alencar Gomes da Silva National Cancer Institute (INCA) of Brazil, the Lisbon School of Health Technology, the Lisbon Polytechnic Institute (ESTeSL-IPL) of Portugal, the Victor Sá Machado Higher Institute of Health Sciences (ISCSVSM) of São Tomé and Príncipe, the National Public Health Laboratory (LNSP) of the Republic of Guinea-Bissau, with the participation of the Pathological Anatomy Service of the Maputo Central Hospital of Mozambique, and the Pathological Anatomy Service of the Dr. Agostinho Neto Hospital, Beach, Cape Verde.

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[1] Sobre Telessaude MZ – Telessaude MZ(https://telessaude.co.mz/about-us/

Figure 1 - RUTE timeline

RUTE: 18 years of collaboration in Health!
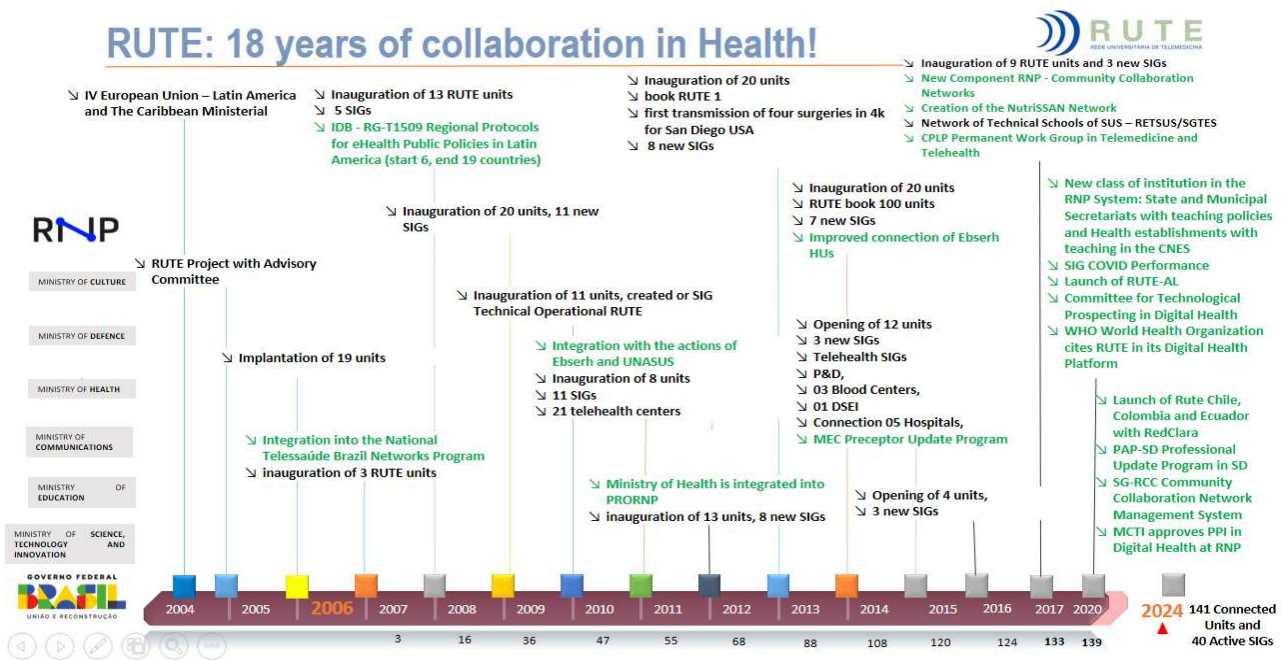
In addition to international collaboration through the CPLP WG, another milestone occurred in 2019 with the creation of RUTE Latin America (RUTE-AL)[11] under the coordination of RedCLARA, Latin American Cooperation of Advanced Networks, with the collaboration of the following NRENs: Ecuadorian Corporation for the Development of Research and Academia (CEDIA) of Ecuador, University Corporation for the Development of the Internet (CUDI) of Mexico, National Academic Network of Advanced Technology (RENATA) of Colombia, National University Network (REUNA) of Chile and National Teaching and Research Network (RNP) of Brazil. Also, in 2021, Chile[2], Colombia[3] y Ecuador[4] began implementing their versions of RUTE-AL with their academic, business and government communities. Mexico, Argentina and Guatemala intend to develop it in their national academic networks.

In the context of national collaboration, we can highlight four other milestones: the creation of the COVID-19 SIG, the beginning of the work of the Technical Committee for Technological Prospecting in Digital Health (CT-SAÚDE DIGITAL), the approval of the Priority Program for Digital Health Informatics (PPI-SD) under the coordination of RNP and the holding of the Human Development and Digital Health in Focus event in 2021, integrating the RNP Forum, the Brazilian Congress of Telemedicine and Telehealth of the Brazilian Association of Telemedicine and Telehealth (ABTMS), and the Brazilian Congress of Health Informatics of the Brazilian Society of Health Informatics (SBIS).

The creation of the COVID-19 SIG at the beginning of the pandemic in March 2020 reinforces the network's great willingness to collaborate, in this case, with its contribution to confronting the pandemic of the new COVID-19 virus, integrating tertiary, university, public, and private hospitals, which carried out the treatment of the most serious cases, exchanging experiences not only between professionals from Brazil but also from China, Italy, the USA, Mexico, Portugal, Israel, Argentina and Russia, among other countries. Between 03/23/2020 and 10/04/2021, 73 sessions were held and 3,052 participations from 1,133 health professionals were recorded.

While SIG COVID-19 was created in the context of the emergency, CT-SAÚDE DIGITAL was created based on a series of motivations: the increase in the number of projects and collaboration networks in the health area in RNP; the digital transformation that is taking place in health, in addition to the demand for broad and complete analyses on the technological evolution of products, applications and services in digital health, and the relationship of RNP with the Ministries from PRO-RNP. Its function is to integrate health and computing professionals in the debates and proposed solutions. Figure 2 presents the timeline of this CT and indicates the activities developed, as well as the participation in the meetings. Representatives of ABRASCO, ABTMS, SBC-CE-CAS, SBIS, SBEB, EBSERH, FIOCRUZ, SARAH Network, NIC.BR, as well as the coordinators of SIG Data Science and Artificial Intelligence in Health, SIG National Telehealth Research Network, SIG Digital Health Education, RNP Research and Development Groups applied to health and representatives of the various RNP boards of directors of CT-SAÚDE DIGITAL.

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[2] RUTE-Chile – Red Universitaria de Telemedicina (https://www.rutechile.cl/)

[3] Comunidad de salud digital - Red RENATA (https://www.renata.edu.co/category/comunidad-de-salud-digital/)

[4] Ehealth by CEDIA (https://ehealth.cedia.edu.ec/)

Figure 2 - CT-DIGITAL HEALTH Timeline
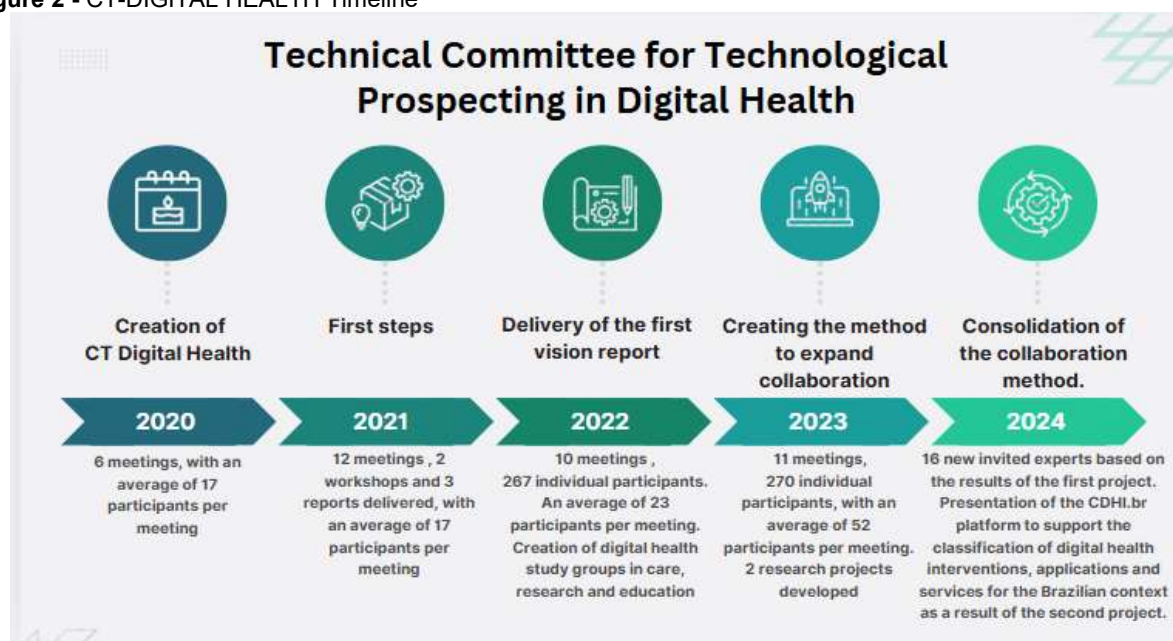
As a joint workspace, following the Digital Health Strategy 2028, this Technical Committee's main element is the technological foresight reported in the annual "vision of the future" reports that guide RNP in its Digital Health actions for the RNP System.

In September 2021, the Information Technology Area Committee of the Ministry of Science, Technology, and Innovation (CATI-MCTI) approved[5] the PPI-SD and awarded its coordination to RNP. The approval of the PPI-SD enabled a portion of the resources invested in I+D+i by ICT equipment producing companies in Brazil, encouraged by the provisions of Law 8,248/91 – ICT Law (including medical, dental, and general health equipment, intensive in the use of digital technologies, covered by this law) in Brazil, to be directed to financing I+D+i projects in this field, which will be developed by Science and Technology Institutes (ICTs) accredited by CATI/MCTI.

In November 2021, the event "Human Development and Digital Health in Focus" was held in a 100% virtual format, integrating the RNP Forum, the Congress of the Brazilian Society of Health Informatics and the Congress of the Brazilian Association of Telemedicine and Telehealth, with the participation of the World Health Organization (WHO), the Pan American Health Organization (PAHO), the Ministries of Health, Science, Technology and Innovation, Education, health professions councils, the National Council of State and Municipal Health Secretaries, the Brazilian Hospital Services Company (EBSERH),

companies and academia. The event had 1,480 registrants, in 100 sessions, with almost 100 hours of content across the three events. On social media, we had 28,000 impressions on YouTube, and 14,000 on LinkedIn, with 1,700 unique viewers.

The RUTE expansions expanded the activities and sessions in the SIGs in collaboration in the network, represented by these numbers obtained from 2015: 101,000 registered attendances in the sessions, 31,034 different participants, 142 operational units, 7,960 sessions held, 44 Special Interest Groups (SIGs) active in 2024.

International expansion

The European Union's @lis Programme, launched in 2002, represented a unique opportunity for the development of digital transformation actions between Europe and Latin America, leading to the creation of RedClara (Latin American Cooperation of Advanced Networks) and the following international telemedicine projects, which even stimulated the creation of RUTE, the University Telemedicine Network in Brazil, coordinated by RNP: T@lemed (Telehealth and Telemedicine applied to Primary Health Care, HUCAM/UFES, and Santa Casa de Misericordia de Porto Alegre) and the Health Care Network (Institutional action of the City Council of Belo Horizonte, medical and technological support from UFMG).

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5   Publication of CATI Resolution No. 228, 2/8/2021. Available at
https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/lei-de-
tics/arquivos_lei_tics_ppi/ppi_resolucao_rnp_saude_digital_228_2021_.pd
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Table 1 - RUTE procedures

Collaboration in RUTE
Over the years, some questions have been recurrent in the context of a RCC. One of these is about who can participate in a SIG. It is important to remember that everyone is expected to collaborate in a collaborative network, so the answer is that everyone can participate in a SIG. In the times of the COVID-19 pandemic, with the explosion of talks, courses, seminars, conferences, and other formats and types of content transmissions on the internet, it was assumed that participation in a SIG was equivalent to consuming digital content, which is correct, in a way, with the advantage of being a synchronous event with the participation of specialists in the area and the discussion of the topic on the agenda. In this way, there is much greater collaboration between participants, increasing knowledge and relationships. It is important to note that the initial participation of all members of the academic community is welcome in any SIG and can be a way to promote a first contact, either with the topic discussed or with the structure provided. However, qualified participation is expected, a real collaboration, in which the member of the academic community takes the information obtained in the SIG to his or her Higher Education Institution (HEI) or University Hospital (HU), colleges and health establishments, municipal and state departments, and discusses ways to actively collaborate with the chosen SIG. Once the forms of collaboration have been defined, the first step is to contact the SIG coordinator to inform him or her of the interest in participating and the collaboration formats. The procedures that guide this participation are available on the RUTE website[8]. HEIs, UHs and other institutions interested in collaborating with RUTE are recommended to read the procedures, complete the corresponding form and send the information. To expand meaningful collaboration in RUTE, the next step is to propose the creation of a new SIG, which is an option available to all user organizations that have joined the RNP System and are part of RUTE. This process involves defining the objectives and the institutions that will coordinate the new SIG, either jointly or individually. It is important to note that the approval process for new SIGs is divided into two stages: the application for joining RUTE and the application for the creation of a new SIG. Both require the approval of the RUTE Advisory Committee (CA-RUTE), made up of specialists in the areas of telemedicine and telehealth and members of RUTE, who are responsible for recommending their acceptance, justifying any rejection and suggesting improvements in case of non-compliance.

Throughout these 18 years of uninterrupted operation in RUTE, collaboration in the network achieved high levels of relationship and cooperation with three virtual scientific sessions every day in 45 health specialties and subspecialties, through the Special Interest Groups or SIGs. Since 2015, more than 100,000 attendees and more than 30,000 different participants have already been registred.

Collaborative actions in health with Latin America and Portuguese-speaking countries have been taking place since the beginning of RUTE, with participation in numerous national and international events, training sessions, and participation in RUTE SIGs. Between 2009 and 2013, UFMG coordinated, in partnership with RNP, the project "Regional Public Policy Protocols for Telehealth", which began with 6 countries but ended with the participation of 19 countries: Brazil, Chile, Ecuador, El Salvador, Uruguay, Mexico, Peru, Argentina, Colombia, Suriname, Guyana, Venezuela, Guatemala, Costa Rica, Paraguay, Dominican Republic, Haiti, Bolivia, and Panama, with funding from the IDB. These actions were deployed in numerous national and international activities, including with the important participation of PAHO, a member of the project.

With Portuguese-speaking countries, the only academic network formed, apart from Portugal and Brazil, is that of Mozambique, the MoRENet network. The relationship and cooperation between RNP and MoRENet are permanent, including through international agreements signed between the respective Ministries of Science and Technology, to which the networks of Brazil and

Mozambique are linked. Several initiatives have been developed with PAHO and WHO based on RNP's health relations with RUTE, including the participation of the national RUTE coordination, RNP, in the WHO eTAG eHealth Technical Advisory Group between 2013 and 2019.

Based on cooperation between FioCruz, Nova University of Lisbon, and RNP, the "Telehealth Strategy for CPLP" was developed, presented and approved at the PECS-CPLP Technical Meeting 2009 – 2016, CPLP Executive Secretariat, Lisbon, February 29 – March 4, 2016, of the CPLP Health Working Group, GTS-CPLP[6].

When the Brazilian Ministry of Health was the president of the CPLP, organized the 1st CPLP Telemedicine and Telehealth Meeting together with the Ministry of Health of Cape Verde in the city of Praia, in September 2017, with representatives of 7 health ministries from the 9 member states: Portugal, Brazil, Mozambique, Angola, Cape Verde, Guinea-Bissau, São Tomé and Príncipe.

In October 2017, at the IV Meeting of Ministers of Health of the Community of Portuguese-Speaking Countries in Itamaraty, Brasilia, the 9 Ministers of the member states of the Community signed the Resolution creating the Permanent Working Group on Telemedicine and Telehealth of the CPLP[7].

In September 2020, the Regional Academic Network RedCLARA and the member National Research and Education Networks (NRENs), such as RNP (Brazil), CEDIA (Ecuador), RENATA (Colombia),

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[6] https://saude.cplp.org/media/s2ndiyva/reunioes-tecnicas-pecs_mar-2016_conclusoes_vf.pdf
[7]https://www.cplp.org/Admin/Public/DWSDownload.aspx?File=%2FFiles% 2FFiler%2F1_CPLP%2FSaude%2FIVR_Min%2FPR4_IVRMS_Telemedicina_Telesa%C3%BAde_vfinal.pdf

CUDI (Mexico), and REUNA (Chile) signed the Memorandum of Understanding that created the Latin American University Telemedicine Network, RUTE-AL. Since then, permanent collaboration has been established between the networks and expansion towards teaching and research institutions linked to the national academic networks[8].

RUTE-MEXICO

Currently, its first SIG is in the process of being implemented, which will be called "The Effectiveness of Medical Tele-Education in Reducing Obstetric Risk in Women with Preeclampsia Criteria Detected by Doctors in Social Service". With the objective of promoting skills in detecting obstetric risk due to preeclampsia in doctors in training using technological and remote tools, it is aimed at doctors in training, who are carrying out their social service, the topics to be addressed are:

● Early detection algorithms for preeclampsia.

● Physical, biochemical, and clinical markers for early detection of preeclampsia.

● Use of ultrasound for uterine arteries detection in the first trimester of pregnancy.

● Follow-up of women with obstetric risk for developing preeclampsia.

● Correct and timely referral of women considered to be at obstetric risk to the secondary level of care.

Actively participates with RUTE-AL to expand and strengthen scientific and educational cooperation in health in Latin America implementing collaborative activities that support the development of a regional telemedicine network.

RUTE- COLOMBIA

The main objective of the Digital Health Community - RUTE Colombia is to promote collaborative work to strengthen the exchange of qualified information and disseminate knowledge through the expertise of actors in the health sector, promoting the construction of new knowledge and/or providing guidelines to support actions and projects of importance for the development of the country.

The working groups have developed products throughout the consolidation of the community according to the line of interest - SIG:

● SIG Education and practices: Digital health competencies document, which is under review to consolidate the final version. The entities of this team are: UNAD, FUCS, UdeA, Colsubsidio, Área Andina and Colsubsidio.

● SIG Approach to health and health technologies: Guidelines for digital transformation for public health and is awaiting funding for its publication. On the other hand, they have designed the Community Protection Information System - SISAFETY, which is in the socialization stage for its commercialization. The entities of this team are: Government of Antioquia, SENA, UdeA.

● SIG Ethical, legal, and financial aspects SIG is working on the construction of the bibliometry that references the ethical, legal, and financial impacts on digital health. The Catholic University of Manizales is the entity that has led the work of SIG.

● SIG Services and Care: RENATA ECHO HUB Project - The ECHO project seeks to improve the quality of life of people around the world through periodic teleconferences that provide mentoring using technology to take advantage of scarce resources in rural areas and sharing better experiences, using case studies as a fundamental basis for learning. RENATA now has the RENATA ECHO HUB that currently, in alliance with the Pan American Health Organization, is currently developing a teleclinic program that supports the mhGAP training process for those health professionals who have been trained by PAHO. In this regard, the RENATA ECHO HUB in alliance with FUCS and with the participation of PAHO experts and health professionals who have been trained in mhGAP in the departments of Chocó, La Guajira, Caldas, and the municipality of Buenaventura developed the mhGAP mental health teleclinics program, which has had 20 sessions with the participation of around 35 people per session.

RUTE-ECUADOR

Since 2021, Ecuador has joined forces with the RUTE-AL project through the e-health by CEDIA program, actively participating in the SIGs (Special Interest Groups). SIGs are groups of experts that promote scientific and educational collaboration in health, bringing together professionals to address regional health problems in Latin America and the Caribbean through development and innovation in digital health. This initiative focuses on technology transfer in telehealth and the use of health information technologies, facilitating cooperation between academic institutions and global networks to improve health care and develop innovative digital solutions.

In 2021, under the theme "One Health", four sessions were held, laying the foundation for fruitful collaboration and knowledge exchange between the different actors in the sector. The evolution continued in 2022 with the theme "Health Tech", during which three sessions explored new technologies and their application in the health field. In 2023, the selected theme was "Future & Digital Health", highlighting four sessions that projected the future of digital health and its implications.

8 https://www.redclara.net/index.php/es/colaboracion/conozca/red-universitaria-de-telemedicina-de-america-latina-rute-al
9https://www.cplp.org/Admin/Public/DWSDownload.aspx?File=%2FFiles%2FFiler%2F1_CPLP%2FSaude%2FIVR_Min%2FPR4_IVRMS_Telemedicina_Telesa%C3%BAde_vfinal.pdf

10 https://www.redclara.net/index.php/es/colaboracion/conozca/red-universitaria-de-telemedicina-de-america-latina-rute-al

In total, 11 different topics have been addressed by 2023, involving nearly 800 participants in a collective effort to advance telehealth and the digitalization of healthcare. For 2024, CEDIA has joined forces with the regional planning of the SIGs, actively participating in the sessions planned by RUTE-AL, consolidating its commitment to innovation and progress in the field of digital health.

This collaboration has not only facilitated technology transfer and the use of new tools in telehealth but has also promoted a comprehensive and collaborative approach in the development of digital health solutions, fostering a robust and resilient ecosystem capable of facing the challenges of the future.

RUTE-CHILE

The Chilean University Telemedicine Network, RUTE-Chile, is an initiative of a prominent group of universities and the National University Network Corporation, REUNA, founded in 2021. It has currently 14 educational and health institutions. Its objective is to promote the development of Telehealth in the country, articulating different projects for training, research, development, and innovation in this area, with special emphasis on technology transfer in Telemedicine and the use of Health Information Technologies.

Three SIGs are currently being developed:

• SIG Functional models for RUTE-Chile telemedicine platforms.

• SIG Competencies RUTE-Chile

• SIG Glossary RUTE-Chile

Recent results of our SIG are that Functional Models are already in the process of characterizing telemedicine care based on ministerial guidelines to define functionalities available for the profiles. SIG Competencies is in the stage of validation of the instrument by experts, and the Glossary is already being presented to the ethics committee.

This year, the new 2024-2025 board of directors took office with a strategic development plan that seeks to enhance RUTE's participation in instances that promote the development of telemedicine in Chile, such as scientific-academic research and dissemination, strengthening ties with international organizations such as the Ibero-American Digital Health Network (RISAD). Likewise, we have been invited to participate in the 2024 Digital Health Forum organized by the Central American Health Informatics Network RECAINSA. In our dissemination plan to promote the development of our area, we will have our second webinar of 2024 during the second semester, to address current issues around telehealth and telemedicine.

The current objective of RUTE-AL is to go beyond traditional webinars and encourage the construction of a permanent collaboration network on health and digital health issues. The series of two monthly SIG sessions features the participation of multidisciplinary panelists,

chosen from among specialists and professors from the member institutions of the NRENs of RUTE-AL. The meetings address the scientific-technical and regional vision on topics divided into two axes. The first is the Health SIG, which addresses the most relevant health issues of today, such as: Origins of the development of health and disease (DOHaD), Cytotechnology problems in Latin America and the Caribbean - LAC in the experience of joint work in the CPLP, Health for indigenous peoples, Health for refugees and immigrants, Onehealth (Human, animal and environmental health), Health, climate change and sustainability (measures to decarbonize health care), Coexistence of obesity and hunger in LAC, and Universalization of health, primary health care and resilience in LAC.

The second is the Digital Health SIG, which addresses specific ICT challenges for health transformation, such as: Cross-border telehealth in LAC, AI adoption in health in the LAC context, AI development in health in the LAC context, Health data governance in LAC, Interoperability in LAC, Digital health public policies, ICT indicators in health in LAC.

For these topics, referenced in technical and scientific publications, it is important to have a collaboration network between governments, academia, and companies to achieve solutions in the LAC region. This is how they help promote RUTE-AL as a mechanism for articulation for collaboration and the promotion of the creation of specific collaboration networks, that is, new SIGs. Those who participate in the sessions could update their knowledge and then join the collective discussion, which allows participants to expand their collaboration network and find regional synergies for their local professional activity.

In this sense, RUTE-AL sessions are designed to attract a diverse audience, including not only researchers, academics, and students, but also professionals working in the health systems of each country, companies, scientific-technical organizations, and government representatives, in areas such as telecommunications, science, technology, and innovation, among others. The diversity of actors of the health and digital health systems is essential to strengthen the digital transformation of the region in health, with the exchange of good practices, knowledge and experiences between countries, as it can help identify innovative solutions, establish strategic alliances and rationalize resources with common approaches.

FINAL CONSIDERATIONS

Over these 18 years, RUTE has evolved into RNP, going through several phases of implementation of telemedicine units, expanded nationally and internationally, and contributed to significant transformations in digital health.

In RNP, RUTE contributed to the inclusion of Community Collaboration Networks as one of the components of the RNP System (Interministerial

components: I – the national Ipê network (backbone) and its Points of Presence and Aggregation Points in the Units of the Federation; II – the Metropolitan Community Networks, based on an associative model of the User Organizations; III – the User Organizations, public or private; and IV – the Community Collaboration Networks. https://www.in.gov.br/materia/-/asset_publisher/Kujrw0TZC2Mb/content/id/55221060/do1-2018-12-14-

Resolution of 12/14/2018), as well as to the RNP[12] usage policy, with the generalization and inclusion of health establishments with teaching activities as a category of user organizations recognized in the RNP System, in the same way as state and municipal health secretariats with public teaching and research policies.

RUTE is a collaborative network for health education and research with more than 18 uninterrupted years of operation and structuring telemedicine and telehealth units in 140 universities and teaching hospitals and 45 SIGs. The most recent WHO publication of the manual Digital Health Platform: Building a Digital Information Infrastructure (Infostructure) for Health recognized RUTE for promoting integration and collaboration for the development of actions in digital health.

RUTE's high-capacity national network infrastructure enables and promotes the innovation of new applications and technologies in health education and remote data analysis. RUTE also promotes the integration of research institutions, streamlining data dissemination and fostering collaborations.[13]

The CPLP Permanent Working Group on Telemedicine and Telehealth is an important achievement, mainly in the advances in digital health in these countries, but also due to the international integration of the SIG CitoTecnología with the participation of 7 of the 9 Portuguese-speaking countries, and others that may arise.

The expansion of RUTE-AL under the coordination of RedCLARA and the participation of academic networks in the launch of RUTE-Chile, RUTE-Colombia, and RUTE-Ecuador are important recognitions of this practice of joint work in health with digital health technologies.

We expect that RUTE's experience and practices will encourage the participation of new user organizations in the RNP System, that we will have more adhesions and collaborations in RUTE, innovative projects, and new models of network collaboration, in addition to the submission of proposals for the creation of SIGs, and participation in these in Brazil, in the GT-CPLP and RUTE-AL, using the SIGs in the existing specialties and subspecialties, as well as in other areas of health, telemedicine, telehealth and digital health.

REFERENCES

1. RNP. Rede Nacional de Ensino e Pesquisa de Brasil [En línea]. Disponible en https://www.rnp.br/sobre. Acceso el 03/07/2024.

2. Ogunmakin R. Internet Capacity of Higher Education and Research Institutes in Africa: The Need for National Research Education Network. American Journal of Educational Research. 2018; 6(6): p. 586-591.

3. Messina LA, Filho JLR, Lopes. PRdL. RUTE 100 - As 100 primeiras unidades de Telemedicina no Brasil e o impacto da Rede Universitária de Telemedicina (RUTE). Ed. 1. Río de Janeiro: E-papers Serviços Editoriais.; 2014.

4. RNP. Redes colaborativas. [En línea]. Disponible en https://www.rnp.br/sistema-rnp/redes-colaborativas. Acceso el 03/07/2024.

5.RNP. RUTE. [En línea]. Disponible en https://rcc.rnp.br/?rcc=RUTE . Acceso el 03/07/2024.

6. Sigulem D, Lopes PRdL. Breve entendimento da telemedicina no Brasil. In Frazão MAM. Diagnóstico em Oftalmologia da Anamnese à Genética. Ed. 1: Cultura Médica; 2017. p. 1320.

7. Brito TDdLV, Lopes P, Meireles L, Moraes M, Messina L, Haddad AE, et al. Classificação dos Grupos de Interesse Especial (SIGs) da Rede Universitária de Telemedicina (Rute) em Grupos Homogêneos com base em Sua Produção em Comunicação, Cooperação e Coordenação (3C). Rev. bras. educ. med. 2019; 43: p. 36-46.

8. Messina LA, Lopes PRdL, Araújo GB, Verde TL, Moraes M, Meireles L, et al. A Pandemia Mudou o Mundo: O Gênio Saiu Da Lâmpada e Nunca Mais Volta. Revista Fontes Documentais. 2020; 3 (Especial: MEDINFOR VINTE VINTE): p. 767-775.

9. RNP. RNP - Noticias. [En línea]. 2013. Disponible en https://www.rnp.br/noticias/rnp-transmite-pela-primeira-vez-cirurgias-com-transmissao-simultanea-em-4k. Acceso el 03/07/2024.

10. CPLP. Declaração Final da IV Reunião de Ministros da Saúde. [En línea]. 2017. Disponible en https://www.cplp.org/id-4447.aspx?Action=1&NewsId=5430&M=NewsV2&PID=10872. Acceso el 03/07/2024.

11. RedCLARA. Red Universitaria de Telemedicina de América Latina RUTE-AL. [En línea]. 2020. Disponible en https://www.redclara.net/es/colaboracion/conozca/rute-al. Acceso el 03/07/2024.

12. RNP. Política de Uso. [En línea]. 2022. Disponible en https://www.rnp.br/arquivos/documents/Politica%20de%20Uso%20do%20Sistema%20RNP%20%28CG-RNP%20.311%29_1.pdf?U1Pn1M8SqElbqO6_7brkgQk2FcdZwP6o=. Acceso el 03/07/2024.

13. WHO, ITU. Digital Health Platform Handbook: Building a Digital Information Infrastructure (Infostructure) for Health; 2020. p.85. Disponible en https://iris.who.int/bitstream/handle/10665/337449/9789240013728-eng.pdf. Acesso el 03/07/2024.

portaria-interministerial-n-3-825-de-12-de-dezembro-de-

2018-55220835