



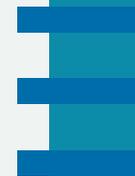
MEMORY CENS2024

*8 years building digital health
in Chile and the Region*

Institutional Memory
National Center for Health
Information Systems

03	Words from the Director
05	Institutionality
06	History
11	Milestones
12	Quality Seal: Software in Telemedicine
15	Reference Competences Model in Health Information Systems
18	Juégatala: Innovation and Change Promotion in Health Program
21	Entrepreneurship Tournaments
23	LACPASS Project
26	Interoperable Waiting Times
28	TechConnect
31	Guide to Good Practices and Recommendations in Telemedicine
33	Other achievements
37	Team
41	CENS Voices
43	The Future

INDEX



WORDS FROM THE DIRECTOR



8 years weaving networks for digital health

With great emotion, I greet you and welcome you to this text, which brings together what we are, and some of the initiatives we have built in these 8 years as National Center for Health Information Systems (CENS). As spiders do, with their 8 legs, as CENS we have created and strengthened networks and collaborations with various actors, always seeking to generate value for people.

Although the summaries omit many things and are sometimes unfair to graph what they aim to tell, this document seeks to convey our main achievements, show who are actively working to improve the quality of health in Chile through its digital transformation, and its challenges ahead.

Is there any more human work than health care? When we talk about technology, we are telling the story about the mechanisms with which people relate to their environment, which undoubtedly includes other people. Therefore, when we talk about the work that a Technology Center like ours has developed, we want to show what mechanisms we have made so the relationship between people is better. That is something we must never forget.

This Memory would have been impossible to carry out without the daily work of our entire team, from our Leaders to our Board of Directors, passing through the Academic Committee, the engineers who are experts in interoperability, or the ones who ensure the quality of the software, our communications and support team, and most especially, those who have trusted us, both in Chile and the foreign. Without the trust of all of them, these years would have been meaningless.

I invite you to read this document as a great story, where people, stories, milestones, and data are intertwined but always seeking to account for the contributions that each achievement has had in enabling the conditions that allow achieving better digital health in the country and the region, that puts people at the center.

I thank you for allowing us to continue building from the CENS, with you and together. We hope that in the coming years, this memory will grow, new collaborations and associations will appear, and we will be able to report on more projects and many challenges met.

Cordially,
May Chomali Garib
CENS Executive Director



Who we are

The National Center for Health Information Systems (CENS) is a non-profit organization, founded by the University of Chile, the Pontifical Catholic University of Chile, the University of Concepción, the University of Valparaíso and the University of Talca, with the support of the Production Promotion Corporation (CORFO) and the National Research and Development Agency (ANID).

The objective of the CENS is to develop strategies and activities that allow us to achieve a more connected health system, innovate through health information and communication technologies, close gaps in knowledge and application of health information systems, and develop criteria for ensuring the quality of those systems.

Vision

To be a national and international reference in Information Technology (IT) in Health, and its management in the public and private sectors, by promoting its enablers through interoperability and adoption of data quality assurance standards, the teaching of advanced human capital, and innovation, all of it for the benefit of the patients, and for most efficient management and administration, ensuring timely and quality information to improve people's well-being.

Mission

Contribute to the promotion, and adoption of health information technologies, collaboratively promoting the development of human capital, interoperability, and best practices in data quality, energizing the innovation ecosystem to improve health care for people in Chile and in the region.

INSTITUTIONALITY

HISTORY

The National Center for Health Information Systems (CENS) was formally created on October 28th, 2016, with the objective to lead the digitalization of the health sector in the country, through the implementation of modern information systems that optimize data management, and improve the quality of medical care.

The idea of its conception arose a year earlier when the Ministry of Economy called for the creation of Technological Centers of the Production Promotion Corporation (CORFO). —led at that time by the current minister Aysén Etcheverry—, to give a boost to the development of strategies and actions that will reduce the gaps in Information Technology (IT) in Health. In

this way, a multidisciplinary team from five universities came together to present a proposal that was finally awarded. The founding higher education institutions that still make up the CENS are the University of Chile, the Pontifical Catholic University of Chile, the University of Concepción, the University of Valparaíso, and the University of Talca.

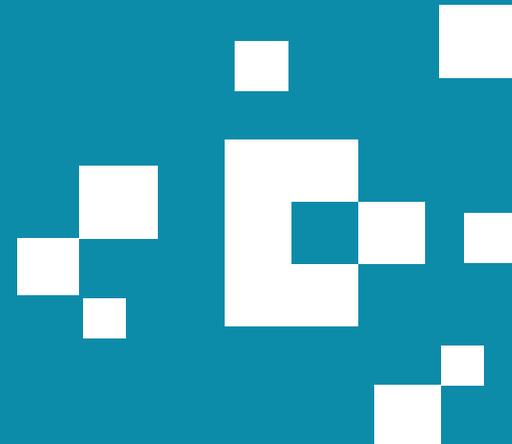
At that time, the project obtained a budget of 5 million dollars for five years, and in its proposal, defined three stages: Installation (from years one to three) Operation and Technology Transfer (fourth year), and Consolidation of the Center (in the fifth year).



Installation

In its first period of life, CENS was driven by the researchers who formulated the project —several of whom today are part of the Academic Committee—, who assumed coordination roles, and then began the task of providing governance to the CENS, hiring highly qualified personnel. At that time, Dr. Camilo Erazo, the first executive director of the Center, joined the team.

Installation was a time of a lot of work and dedication to the project, where the spirit that prevailed was collaboration and motivation for being, for the first time, joining forces from different places to build a Center that marked a turning point in the history of digital health in Chile.



In terms of activities, during this period various events, training, and in general initiatives were carried out that made it possible to bring together people in large numbers, promote the creation of the center, disseminate international experiences, raise awareness about the relevance of moving towards better information systems in health and support innovative health venture initiatives in different territories of the center. In essence, the focuses were the formation of human capital, awareness-raising, and the generation of networks, focused on the different country regions. Some of the activities that stood out at that time were TechConnect, support for the Everis Digital Hub, and TechChallenge, among others.

In these first years, projects were also developed that, over time, gave rise to the CENS areas, remaining to this day: Innovation and Entrepreneurship, Interoperability, Human Capital, and Software Quality.

These gained greater strength in 2018, when the team began to guide part of the work on the sustainability of the Center, to ensure its continuity over time. Products such as the Huemul platform and tools to measure the quality of health software are generated. In parallel, cooperation agreements linked to health information technologies are signed with public and private entities, both national and international.



Pandemic period

Despite the complexity that the pandemic meant for the health sector, this was a period in which the role of CENS gained special relevance in the country, and also in Latin America and the Caribbean: building and strengthening health information systems was more necessary than ever before in history. In this context, the Guide of Good Practices in Telemedicine was launched, and shortly after, the Quality Seal: Software in Telemedicine was born (both initiatives will be further explored in the following pages).

In 2020, Dr. May Chomali took over as Executive Director. With an outstanding career in the public and private spheres, she came strength to the institution in this key period. If at the beginning, CENS's mission was to promote a cultural change in digital health, now the Center's challenges were sustainability to continue strengthening work in the area, opening new

opportunities, and creating new collaboration networks with other entities, including the Ministry of Health.

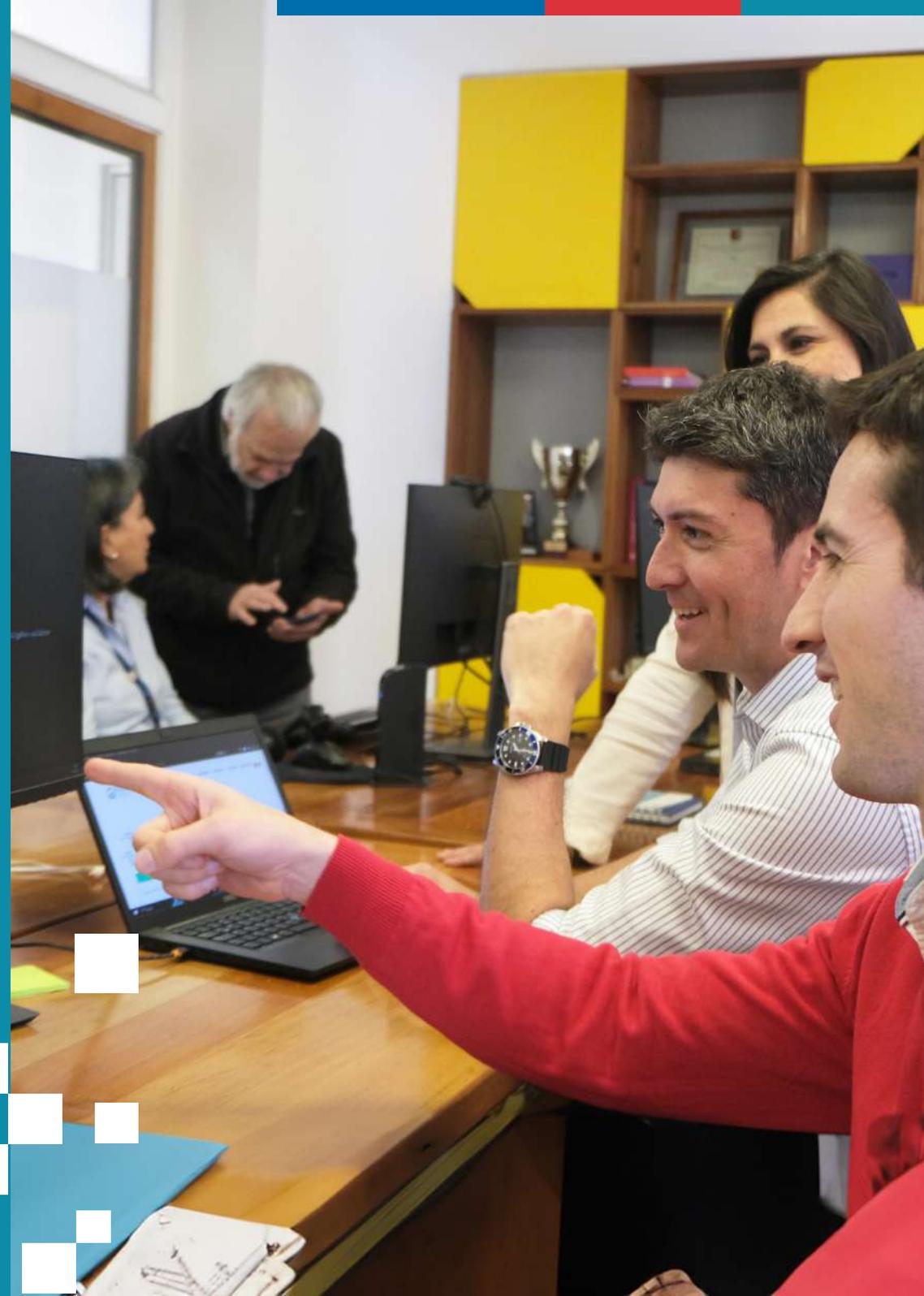
In this period, CENS migrated as a Technological Center from CORFO to the National Research and Development Agency (ANID) to the newly created Ministry of Sciences, Technology, Knowledge, and Innovation.

With an increasingly formed ecosystem, CENS continued working on national projects and also began to look beyond local borders. This is how, even in times of pandemic, the Regional Public Good “Digital Transformation in Health to Mitigate the Effects of COVID-19 in Latin America and the Caribbean”, also called the LACPASS Project (in the next pages this initiative will be further explored, as one of the milestones of the CENS).



Present

In these 8 years, the National Center for Health Information Systems has achieved to position itself as a reference in digital health, with a series of initiatives, strongly promoting interoperability, innovation, training, and software quality, in projects that will be described in the next pages. However, the team does not lose its focus: there are still great challenges and, as time progresses, others will arise that will require CENS's experience. The momentum and conviction remain intact: to improve people's lives requires a substantive improvement in healthcare. That's why the Center is expected to continue contributing to the digital transformation of Health sector for a long time to come.



EIGHT MILESTONES, EIGHT YEARS

Throughout its eight years of existence, CENS has worked on the development and strengthening of the digital infrastructure that supports the health system in the country and the region. During this period, the Center has played a crucial role in the creation of platforms, guides, and models that have allowed the Ecosystem to improve the quality of health services, increase efficiency in the management of clinical information, and facilitate care access for patients through technological solutions.

This section shows the eight most representative milestones of this path, the result of joint work with different stakeholders in health and technology sectors, public and private, and national and international organizations. These achievements have had a direct impact on the standardization of key services, the creation of interoperable platforms, and the definition of competencies that have raised the quality of digital health services provision.

Over the years, CENS has promoted significant advances in areas such as telemedicine, process optimization in healthcare, and the secure and efficient exchange of clinical data. The impact of these achievements has not only remained at the national level but has contributed to the creation of a digital health ecosystem throughout the region.

We invite you to learn about these milestones, which express part of the work carried out in our eight-year history.

QUALITY SEAL: SOFTWARE IN TELEMEDICINE

From the conviction that telemedicine is an essential tool in health care, only if it is provided through platforms that meet quality standards that ensure adequate patient care, since 2020 our National Center for Information Systems in Health, through its Quality area, grants the Quality Seal: Software in Telemedicine (Sello de Calidad de Software en Telemedicina).

Making a bit of history, this seal arises as the continuity of the first call for the “Software Quality Program in Digital Health: Telemedicine Solutions to Overcome the Pandemic”, carried out by CENS. Its goal was to evaluate compliance with technical requirements and standards in health information systems, associated with digital solutions with a focus on telemedicine and, on the other hand, to measure clinical requirements that are determining factors in a solution of this type.

In the context of the COVID pandemic, emerges the need to guarantee the quality of telemedicine systems, and a strategic alliance emerges that lasts to this day: the National Health Fund (FONASA) signs a collaboration agreement with CENS, endorsing its quality as a certifying body for telemedicine solutions, which today it continues to hold only alongside FONASA.

How does it work? CENS develops its own Seal, that complements the verification of a Technical Annex defined by FONASA with the evaluation of a series of clinical questions.

Currently, 23 platforms have obtained the Telemedicine Seal through CENS evaluation, , while 14 are in the process of getting it.

TELEMEDICINE'S SEAL

What is this technological service about?

The evaluation consists of applying a Quality Tool and an Analytical Quality Assurance Evaluation Process for Telemedicine Software. Once the company or technology operator is registered, they are granted access to a quality tool, which includes a set of questions designed to evaluate clinical and technical aspects of their solution, according to basic requirements associated with the priorities and needs of users in the health sector in Chile.

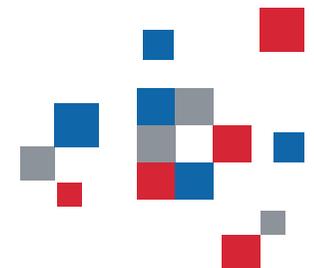
This tool requests verifiable evidence that is normally produced during the development of the software product, from its gestation to its most advanced stage (implementation, testing, or deployment, as appropriate).

Once the answers are registered in the tool, the Evaluation and Review Process begins, to ensure that the answers and evidence provided are consistent with the problem that the developers declare to address, through their product, and with the

objectives of quality adopted by CENS. The result of this evaluation is delivered through a Results Report, with observations for improvement, if any.

Once the process has been successfully completed, complying with the requirements, CENS proceeds to deliver the Software Quality Seal in Telemedicine. In this way, the health ecosystem is provided with an element of confidence that the software to be implemented in public and private health providers meets the quality objectives established in the CENS Quality Model and the criteria required by FONASA to consider them telemedicine solution providers.

Within the next steps in improving and updating the Seal to current challenges, an interdisciplinary project is being initiated. Its objective is to build the Software Quality Seal in Telemedicine 2.0, which entails establishing the content of the reviewed version and its evaluation process, adapting it to new regulations and legislation appeared in the last months.



What benefits bring the Seal to the company or technology operator?

- They are provided with certification for the tools used to provide teleconsultation services (Both, in front of the ecosystem and FONASA)
- Confidence is provided that the tool used to provide telemedicine services meets the desired quality standards and good practices.
- A competitive value is generated in the market, by having a tool that has the seal and is endorsed by FONASA.
- Startups and companies can demonstrate their technical quality to hospitals and clinics interested in implementing their solution, confirming that their solution is ready to be implemented in the market.
- The evaluated entities receive recommendations to adjust their solution according to international quality criteria.
- The entities that obtain the Seal are disseminated on the platforms and in the activities that the CENS organizes on the subject.

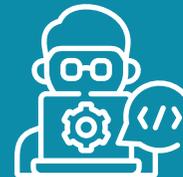
Who is the seal aimed at?

- Startups and small businesses that want to demonstrate the level of evolution and quality of their product or service to hospitals and clinics, and confirm that they are ready for deployment.
- Large companies that want to evaluate the quality of their startup products and services to incorporate them into their portfolio of solutions or suppliers.
- Health providers who wish to require this technical quality evaluation of products and services from their suppliers, or evaluate their developments.
- Other entities that are interested in the process.

What is evaluated?

Clinical Domain

- Health Objective
- System Type
- Actors (relational model)
- Using external devices



Technical Domain

- Compatibility
- Usability
- Reliability
- Security



REFERENCE COMPETENCES MODEL IN HEALTH INFORMATION SYSTEMS

In 2018, the National Center for Health Information Systems, CENS, developed the first Model of Reference Competencies in Health Information Systems. This was an unprecedented initiative in the country and Latin America, which brought together the essential knowledge, skills, and attitudes related to Health Information Technologies in Chile. Its objective was to establish standards in the skills of professionals and technicians in the field and in this way concretely advance towards better digital health.

The first Model was prepared by the Human Capital area at CENS and, in addition, it was reviewed by 40 representatives of the productive sector and the academia—members of 24 institutions in the country, public and private—who provided feedback on the proposal. Subsequently, the Model was also selected and presented at the

AMIA 2018 International Congress, obtaining important comments from international actors.

This model has positioned itself as a national and international benchmark, that guides the excellent training of the sector, the design of undergraduate and postgraduate training programs, and establishing common training standards.

It has also guided the CENS' work training materials, for example in our courses design -such as "Health Information Systems and Interoperability"- and in tools to advise the update or creation of academic programs in higher education institutions.

The first version had 2 areas in Health Transformation and Technology; 8 domains in Work Performance; 32 competencies and 136 subcompetences, in addition to legal and ethical aspects in a transversal manner.

REFERENCE COMPETENCES

Competence Model 2.0

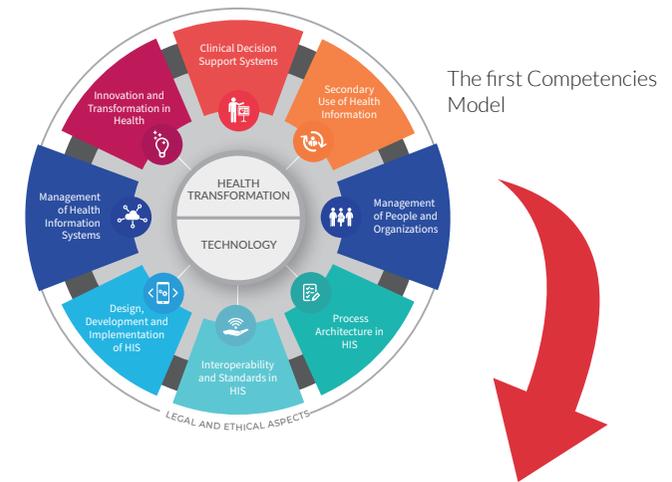
To generate an updated reference competency model, incorporating new areas of digital health and post-pandemic learning, at the end of 2022, Human Capital area, began to work on a new version, which was finally launched in June 2024.

With the delivery of this public good, CENS aims to consolidate itself as a reference entity in the digital health ecosystem, at the training and certification level, both in the private, public, and academic sectors, supporting through curricular integration strategies, the installation of capabilities in the development teams and clinical users on digital health.

Like the first version, this Reference Competencies Model in Digital Health 2.0 brings together knowledge, skills, and attitudes, for an ecosystem where people responsibly face challenges and contribute to the digital transformation in healthcare. Competencies describe those knowledge, skills, or attitudes that allow us to face a situation or problem in an integrated manner.

Its domains and competencies allow us to develop and renew curricular frameworks up to graduation profiles, guide new undergraduate and graduate careers, steer training in the world of work, and facilitate the survey and recognition of labor profiles, both in the country and in the region. In this way, people not only acquire knowledge but are also trained to act in a manner relevant to a problem or challenge, taking charge of its implications.

The Model shows what is expected of professionals and technicians in this sector and guides people with job training opportunities and their professional development. The domains and competencies allow the generation of training itineraries, organizing the learning process as a continuum, and facilitating the construction of individual and institutional training trajectories.



Competence Model 2.0



How was the Model developed and updated?

The first Reference Competencies Model was developed during 2017 and 2018, and published in 2019. Based on it, 12 professional profiles, training courses, advice, and collaborations with the University Telemedicine Network (RUTE) were designed, and the competence tables of the Digital Health Network of State Universities (RSDUE).

Based on the experiences and learnings from the pandemic, CENS, the Universities, and the public and private ecosystem, made available a new version of the Reference Competencies Model 2.0 in 2024, which is also continuously updated with the network of national and international experts who are part of the Center.

The mode Updates in its new versions are carried out through qualitative studies, deepening cutting-edge reference competencies, which allows for continuous incorporation of improvements and specifications.

It is important to note that to date, 10 institutions have worked with the Model of Reference Competencies in Health 2.0, a document that is available for public use in order to encourage all institutions to promote the development of digital health.



JUÉGATELA: INNOVATION AND CHANGE PROMOTION IN HEALTH PROGRAM

In August 2022, the first version of the Innovation and Change Promotion in Health Program (Juégatela por la Innovación e Impulsa el Cambio en Salud) officially began an initiative promoted by CENS and Pro Salud Chile, with the support of Corfo and the Ministry of Health. The program was launched in response to the need to accelerate the adoption of digital tools in a sector that has traditionally shown some resistance to change, such as healthcare, considering that people's lives and well-being are at stake.

Since its inception, the Program has worked under a central premise: mobilizing key actors in the health ecosystem—including public and private institutions, technology startups, and universities—around a common challenge: innovation aimed at the well-being of patients and the modernization of health institutions.

In Chile, the word “Juégatela” has two meanings, one related to playing a game, finding solutions, and never losing the fun;

the other is an action call, to play a leading role in some activity. Hence, Juégatela Program aims to learn, do things well, and lead innovation in people's institutions.

The program trains health providers, for innovation and creation of pilot units which through different stages; (1) generates capabilities to define problems that affect them, and provides tools to innovate to those who are selected in the call, (2) promotes the generation of matches with startups and/or companies that are available to propose solutions for those problems identified in stage #1, and (3) startups and/or companies pilot their solutions in health institutions, thus creating a virtuous circle that, in its first version, showed important achievements.

First version

After a call in June 2022, 70 participants from thirty health institutions were selected, who began their training in August of the same year. At that time, the program

JUÉGATELA PROGRAM

had three challenging stages, which not everyone could ignore: five institutions completed all the stages: “National Cancer Institute”; “Adriana Cousiño” Hospital at Quintero county, ; “Telethon” National Rehabilitation Hospital; “San José de Melipilla” Hospital at Melipilla County and “Dra. Eloísa Díaz Insunza” Hospital at La Florida county . Of all of them, these last two hospitals, received the Innovation Unit Seal, for complying with all the requirements of the “Juégatela” program, and two of its representatives were awarded for their deep commitment to innovation.

After this first successful version, CENS and Pro Salud Chile did not hesitate to continue with the initiative, calling for a second version this year. In this way, on July 24, the training of this new group of participants began –some of whom already participated in the first stages of the initial edition–, which in number doubled the previous call: 145 people are part of the program, also

145 people are part of the program, also belonging to more than 30 health institutions, from all regions of the country.

belonging to more than 30 health institutions, from all regions of the country.

Currently, the program has been selected as a finalist in the “CPI Training” category of the Ruta CPI Awards 2024, being the only Chilean representative to reach this stage. With this, the initiative has managed to position itself among the best 33 projects in nine countries, all of them aimed at promoting Public Procurement of Innovation (CPI, in Spanish) in the region.

In the coming years, the program will seek to continue expanding its reach, involving more actors in the health ecosystem and promoting new areas of innovation such as artificial intelligence, predictive analysis, and personalized medicine. With this, it is expected that “Juégatela por la Innovación” will continue to be a pillar in the digital transformation of health in Chile, contributing to a future where technology is at the service of people's well-being.





New 2024 “Juegatela” Program stages

Stage 1: Training Program

- Implement a digital health training program based on the Reference Health Competencies Model, which enables health institutions to innovate.
- Integrate good practices and change management methodologies into institutional guidelines, facilitating digital transformation in the health sector.
- Promote and scale innovations focused on users of the health system, establishing policies, and strategies and evaluating key indicators to improve the quality of services.
- Expected outcome: define a problem to be solved within the institution.

Stage 2: Match-Making: Challenges Solutions

- DCall companies and/or startups that have solutions that solve the challenges.
- Define minimum requirements that startups/companies must meet to carry out a pilot of their solution..
- Institutionally actors commitment to carry out the pilot.

Stage 3: Solution Validation

- CENS Accompanion during the development of the piloting of the solution.
- Development of expert mentoring according to the needs of the institutions.
- Support the search for financing for the creation of the solution piloting and piloting unit.

Stage 4: Impact Measurement

- Identify and size the value/benefits generated by the pilot in relation to the initial situation (before the pilot).
- Project the implementation at the productive level (scaling the pilot at the organizational level).

ENTREPRENEURSHIP TOURNAMENTS

Intending to promote technological innovation and entrepreneurship in the field of digital health in Chile, emerged from CENS, the Entrepreneurship Tournaments program. Looking to identify and support innovative projects that are already improving health information systems and developing solutions based on emerging technologies such as artificial intelligence, telemedicine, and interoperability systems.

The topics that were included in these instances were entrepreneurship, business management, and health technologies, supported by CENS experts and a network of more than 25 mentors from different areas of expertise. This program contributed to validate innovative solutions, both clinically and commercially, enhancing the scalability and internationalization of the solutions. In this context, two instances were developed, the CENS Tech Challenge Tournament, and Innovation Challenge in Maipú.

Tech Challenge

This event was a digital health entrepreneurship tournament organized by CENS, in conjunction with OpenBeauchef of the University of Chile and other institutions such as the telemedicine company ITMS Chile, and CORFO. The tournament, which was held for the first time in 2019, sought to support entrepreneurs with innovative technological solutions to improve interoperability in the Chilean healthcare system and promote digital transformation.

The tournament brought together 170 startups interested in promoting interoperability in health and responding, through innovation, to different national challenges identified by the Chilean Ministry of Health in conjunction with the Government Laboratory (Labgob).

ENTREPRENEURSHIP TOURNAMENTS

Participants received training in standards such as HL7 FHIR, in addition to mentoring and opportunities to pilot their innovations in hospitals and health centers. The training plan included a total of 127 hours, both in-person and remote, along with the support and participation of outstanding professionals, who—in the role of teachers and mentors—supported and guided them in their different needs throughout the entire tournament process.

The event ended up with a Pitch Day, where the winners received important prizes: the first place got a trip to the international conference Health 2.0/HIMSS in the U.S., and the first three places piloted the

Innovation Challenge in Maipú

The Pharmaceutical Innovation Chamber, Puentte Consulting, the Municipality of Maipú, and CENS launched the Innovation Workshop in Primary Care Centers in the Maipú community. This workshop aimed to build innovation capacities by identifying high-impact challenges and solutions to address post-pandemic gaps through collaborative work and citizen participation.

Outstanding professionals, who—in the role of teachers and mentors—supported and guided them in their different needs throughout the entire tournament process.

The main challenge to be addressed was: How can we manage the demand for primary care at municipal health centers (Cesfam) in Maipú to ensure timely access to treatment and monitoring of chronic conditions? This initiative also aimed to support entrepreneurs or companies with high potential, impact, and scalability, so that through their solutions, they could generate innovation and technological development in the community.

Over four weeks, residents, professionals, and directors from four local health centers (Cesfam) collaborated, using innovation and design tools to develop effective solutions to these issues. At the end of the program, participants presented their solutions to a committee, and a call was opened for startups interested in implementing solutions to these challenges.

In addition to training participants in innovation and design skills, this initiative promoted collaboration among the main actors in Maipú's health ecosystem, becoming a model for other municipalities and organizations.



LACPASS PROJECT

The need for interoperable health systems transcends borders, especially in a scenario after a world pandemic. It is in this context the “Regional Public Good Digital Transformation in Health to Mitigate the Effects of COVID-19 in Latin America and the Caribbean” also called the LACPASS Project appears, an important three-year initiative executed by CENS, with the sponsorship of the Inter-American Development Bank (IDB), and supported by the American Network for Cooperation on Electronic Health (RACSEL). Its objective was to create bridges in health care for all people in the Latin American and Caribbean region.

This project is a response to the urgent need to create interoperable health systems in a diverse and geographically wide region, where the COVID-19 pandemic revealed gaps in digital infrastructure and the lack of integration in health systems. In this

context, since its inception, LACPASS has sought to establish a solid foundation for cross-border interoperability, facilitating the secure and efficient exchange of health information between participating countries.

The main objective of LACPASS is to guarantee that people in Latin America and the Caribbean have a valid and cryptographically verifiable digital vaccination certificate, in line with international standards. This initiative is not only part of the health response to COVID-19 but also represents a key step towards creating a more robust and sustainable digital health infrastructure in the long term, which allows a coordinated response to future crises.

Among the strategic partners of the project are the Pan American Health Organization (PAHO), the international standards entity

LACPASS

Health Level Seven International (HL7), the blockchain platform LACChain, and the digital health integration initiative IHE (Integrating the Healthcare Enterprise). In addition, it has the participation of 14 countries, including Argentina, Chile, Colombia, Brazil, Peru, and Uruguay, among others, which underlines the regional and collaborative nature of the project.

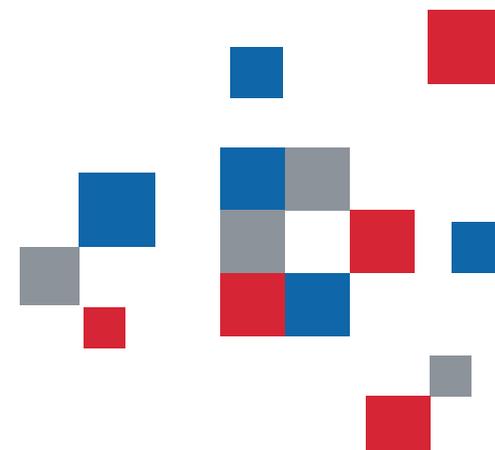
In its initial phase, LACPASS successfully implemented a digital vaccination certificate model based on the standards defined by the European Union (EU DCC), allowing the issuing and validating countries of the COVID-19 certificate to adopt an interoperable and widely accepted solution. This facilitated the safe verification of the vaccination of citizens inside and outside its borders, improving international mobility and contributing to the economic reactivation of the region.

The project's technical success was achieved at the LACPASS Conectatón, an event held in Santiago de Chile in 2022, where eight countries tested their digital certification systems. This event was a historic milestone for Latin America and the Caribbean since the viability of cross-border health interoperability was



practically demonstrated for the first time. In parallel, the General Assembly of RACSEL was held, where the countries agreed to strengthen their cooperation network and formalize the governance aspects for interoperability in digital health.

LACPASS is experiencing its second phase, focused on two large areas of work: the evolution of the COVID-19 certificate



towards the DDCC (Digital Documentation of COVID-19 Certificates) and the implementation of the International Patient Summary (IPS) a standardized profile that allows to share medical securely and efficiently cross-border.

The holding of the second LACPASS Conectathon, which in 2023 brought together 18 countries in Sao Paulo, Brazil, and the third version of this event, held in 2024 –the last year of the Project– the same number in Bogotá, Colombia.

LACPASS has managed to consolidate itself as a regional cooperation model that uses new technologies to improve public health management.

Coordinated efforts between governments, international organizations, and technical experts have demonstrated that health interoperability is an achievable and necessary objective for the region.



18 countries participated in the recent Connectathon, which is part of LACPASS

It is expected that the next steps of this initiative will not only be limited to the interoperability of vaccination certificates but will also include other key aspects of healthcare, such as access to medical records and collaboration in the care of health emergencies. This holistic approach will contribute

to strengthening the region's health systems, improving the quality of life of millions of people, and preparing them for possible future health crises.



INTEROPERABLE WAITING TIMES

The Interoperable Waiting Times project launched in October 2022 by the Chilean Ministry of Health (MINSAL), aims to improve the management of waiting times for new specialty consultations need, within the public health system. This project addresses a persistent problem in the Chilean health system: the lack of traceability and visibility in the management of waiting lists and times, which prevents patients and health professionals from accessing updated information on the status of each request. Traditional systems do not allow us to precisely know the reality of waiting times, which limits the ability to coordinate and optimize care.

Through the collaboration of several MINSAL divisions, such as the Healthcare Network Management Division (DIGERA), the Department of Statistics and Health Information (DEIS), the Primary Care Division (DIVAP), and the Department of

Technologies of Information and Communications (ICT), an interoperability platform has been launched to aiming to improve coordination between the different levels of care and, ultimately, reduce long waiting times for specialty consultations.

CENS has played a fundamental role in this project, accompanying the development of this interoperability system and training IT teams in health services. The main objective is to provide a tool that facilitates information management without generating an additional burden for health professionals. This interoperability is based on a secure clinical data system that allows the registration, transfer, and analysis of medical information, improving the quality and accuracy of the information.

INTEROPERABLE WAITING TIMES



The project began in three Health Services: Biobío, Talcahuano, and Metropolitano Occidente, and until July 2024 it has shown very positive results: more than 30.000 interconsultations have been carried out through the interoperability platform, which has proven to be significant progress towards reducing waiting times for specialized care. These initial results have been auspicious, indicating a promising future for nationwide implementation.

The project is designed to be progressively scaled to the country's remaining 26 health services, ending by December 2025. To support this process, B-PRAC SIS (Good Practices in Health Information Systems), a CENS tool to assess Institutional maturity for the digital transformation process is being applied, in all 29 health services and in more than 50 highly complex hospitals. This tool allows measures of multiple dimensions, which is key to ensuring a successful implementation of the new systems.

“
2025 is the year when it
is expected to be
operational in all services
health across the country

Simultaneously, MINSAL and CENS have launched a series of Interoperability Workshops based on the international standard HL7-FHIR, which is essential to ensure that health systems can communicate and share information efficiently. These workshops have involved more than 200 professionals from the public health system, training them to manage the new interoperable systems and ensure their correct implementation.

In summary, the Interoperable Waiting Times project is part of the digital transformation strategy of the health system in Chile. Its successful pilot health services marks important progress toward improving the quality of care in the country, and the gradual approach to its implementation, together with the continuous evaluation of institutional capacities, ensures that the public health system will be ready to adopt this innovative solution. As this project is deployed throughout Chile, a substantial improvement in waiting times and the patient experience is expected, by making the clinical care process more transparent and accessible.

TECHCONNECT

Since the CENS's beginning, we have led various initiatives to promote interoperability in the digital health ecosystem in Chile. One of the main manifestations of this commitment was a TechConnect event, which was positioned as a key platform for training, learning, and implementing international standards in interoperability, specifically the HL7 Fast Healthcare Interoperability Resources standard (FHIR).

In 2017, the first Pre-Conectatón activity was organized at the national level, setting a precedent for health interoperability events in Chile. This instance was part of the “Interoperable Medical Account” project,

aimed to improve communication and data exchange between health providers and FONASA.

One of the fundamental pillars of the Pre-Conectatón was the incorporation of the Messaging, Security, and Architecture Implementation Guides, developed with the advice of CENS. These manuals provided participants with a solid foundation to operate in a safe and efficient environment and were complemented by validation tools. The success of this activity prepared the bases for the TechConnect event 2018 and 2020 editions, of great relevance in the digital health ecosystem in Chile.

TECHCONNECT

TechConnect 2018

In October 2018, CENS organized the first edition of TechConnect, an event that stood out for being the first Conectathon at the national level, bringing together 140 participants. The main objectives of the event focused on the dissemination of the use and application of the HL7 FHIR interoperability standard, through the resolution of practical problems, aimed at the creation, reading, updating, and deletion of FHIR resources in a specific scenario, thereby which the participants worked directly with the standard.

In addition, it was sought that professionals could apply their knowledge about HL7 FHIR in a particular context, known as

Track, using specific resources. This allowed the validation of the technicians' and developers' skills to execute practical exercises that replicated real situations of data exchange in health information systems.

Another key purpose was to support and guide the learning of the HL7 FHIR standard as the foundation of the future of clinical information exchange. The conference encouraged the participation of all actors in the health ecosystem in new digital initiatives, highlighting the importance of interoperability in these technological advances.





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TechConnect 2020: II Health Interoperability Meeting

In November 2020, CENS organized the second edition of TechConnect: II Health Interoperability Meeting, which convened hundreds of participants. This event was held in a context marked by the COVID-19 pandemic, which highlighted the importance of interoperability and the need for robust and connected health information systems.

Unlike previous editions, this TechConnect included a series of previous talks, conferences, and workshops aimed at developers, product leaders, decision-makers, technicians, and professionals linked to digital health. Along the same lines, through the “Interoperability Challenge”, the specialized training process in the effective exchange of information between Health Information Systems was strengthened, to develop a community prepared for the new challenges of Digital Health in Chile.

The main event was organized into four tracks of work that allowed participants to solve practical interoperability problems. These activities were designed to offer both beginners and advanced users the opportunity to learn and apply the HL7 FHIR standard in realistic scenarios. The

tracks included challenges on “Patient”, “Diagnosis Report”, “Electronic Prescription” and “Electronic Clinical Agenda”.

One of the most innovative aspects of TechConnect 2020 was the introduction of two use cases that allowed more qualified participants to develop web applications capable of interacting with CENS servers. These activities, focused on the “Electronic Medical Prescription” and the “Diagnostic Report”, gave developers the opportunity to apply their knowledge in a realistic environment and receive real-time feedback.

In the context of its creation, TechConnect played a crucial role in forming a community of professionals and developers on interoperability standards in Chile. The event not only grew in the number of participants during the years of its execution but also in the quality and complexity of the exercises and challenges presented.

CENS' commitment to interoperability and quality ensures that all the learnings, during these editions continues to be a key piece in the development of a more connected, efficient, and accessible healthcare ecosystem for all.

GUIDE TO GOOD PRACTICES AND RECOMMENDATIONS IN TELEMEDICINE

In April 2020, in response to the COVID-19 health crisis, the National Center for Health Information Systems launched the first version of the Guide for Good Practices and Recommendations in Telemedicine. This key document served as guidance for health professionals and decision-makers offering medical care remotely.

This guide was developed with a particular focus on teleconsultation, a modality that became a fundamental tool to ensure the continuity of care in a context where social distancing was urgent. The need to avoid presence in hospitals led to the implementation of this material as a reference for health professionals, decision-makers, and technology managers, who found in the document clear guidelines for the adoption of safe and efficient teleconsultation.

Among the most relevant aspects of the guide are the recommendations for decision-makers on the implementation of telemedicine services from public and private providers, as well as the development of strategies and protocols that would allow remote care to be

managed without compromising quality, and guaranteeing safety for users.

In addition, the guide includes practical resources for health professionals, to help them carry out teleconsultations under quality criteria in their respective institutions, guaranteeing the safety of both; patients and work teams. These recommendations focussed on the necessary technological infrastructure, risk management, and data confidentiality.

The launch of the Good Guide Practices and Recommendations in Telemedicine was accompanied by a series of activities that consolidated its adoption in the different areas of public and private health in Chile. On April 14, 2020, the first version of the guide was formally presented in a virtual event that included the participation of authorities and experts in digital health. Then, on April 22, same year, the webinar “Implementing telemedicine in the public sector” was held, where the challenges and solutions offered by this type of care were delved into to face the health crisis in the country.

TELEMEDICINE'S GUIDE

Subsequently, on April 29, 2020 during the webinar “Telerehabilitation in Chile – Experience and Good Practices against COVID-19”, the different opportunities to apply telemedicine in areas such as rehabilitation were addressed, adapting these new technologies to the health context in which the country was located. Finally, on May 6, 2020 the workshop “Patients as protagonists of Teleconsultation” was held, the objective of which was to explain the active role that users have, when preparing remote care with health professionals.

This process was also significant for how the guide managed to integrate different actors in the digital health ecosystem. For its preparation, CENS had the participation of experts from universities, health centers, and clinical, and technological organizations, who worked together to create a robust document adaptable to the needs of the country.

The collaboration of entities such as the University of Concepción, Pontifical

Catholic University of Chile, the University of Chile, the Medical College of Chile, and the National University Network (REUNA), among others, was essential to ensure that the recommendations included in the document responded to international best practices in telehealth, but also to the local Chilean reality.

The Guide to Good Practices and Recommendations in Telemedicine is a concise example of how the health crisis promoted innovation and digital transformation in the health sector, both in Chile and in the world. The COVID-19 pandemic prompted systems to rapidly adapt to new forms of care, and the guidance provided a solid foundation for industry professionals and decision-makers to address these challenges. By establishing clear guidance and practical resources, this document facilitated the implementation of telemedicine throughout the country, ensuring that users continued to receive safe, quality care, regardless of geographical barriers or restrictions imposed by confinement.



OTHER ACHIEVEMENTS

While the main milestones reflect great progress, other achievements have been developed in these eight years. Through a wide range of projects and collaborations, CENS has consistently worked to develop solutions and standards that strengthen both human capital formation and health technological infrastructure.

One of the key axes has been the implementation of training programs that guarantee the quality and relevance of digital health professionals. Initiatives such as the Quality Seal of Training Programs, the Curriculum Integration Workshops, and the Training Courses have involved hundreds of professionals and institutions from all across the country, contributing to the strengthening of the skills necessary to face the challenges of the sector.

In parallel, CENS has developed several platforms and services, such as the Huemul learning platform and our CENS-Pharma Terminology Service, which have facilitated the adoption of international standards for the management of clinical information and interoperability.

The Center's work has also contributed to the consolidation of a national and international network in digital health. From the formation of HL7 Chile to the collaboration with the Colombian Ministry of Health, CENS has laid the foundations for regional and global integration in the use of information technologies in health. This collaborative approach is also reflected in the creation of the Health Innovation Ecosystem (ECO-SD), which brings together various institutions and startups in the country to promote innovation and the development of technological solutions in health.

Training Programs Quality Seal, which was born from the Reference Competencies Model and which to date has been obtained by 28 programs from universities in our country.



Job Profiles in Digital Health, contemplates the definition of 4 Roles, the definition of 1 transversal Domain, and 8 Domains with 104 Competencies.



Curriculum Integration Workshops and other related advice, with more than 20 institutions (including public and private universities) and nearly 400 participants, from eight regions of the country.



Foundation of the Sectoral Organization for Labor Skills in Digital Health. Its objective is to raise job profiles subject to certification and build training-labor routes.



Training Courses, which have also been built from the Reference Competencies Model and have had the participation of more than 400 professionals who have been part of the CENS campus.



“Huemul” Learning Platform, a space created by CENS to promote self-teaching and learning of the health information exchange standard, HL7 FHIR.



Best Practice Guides and Recommendations, on topics such as Interoperability of Medical Devices and Clinical Records Under HL7 Standards; in Telemedicine; to Innovate in Health, among others.



Clinical Data Repository Project, which allowed the Araucanía Sur network to have access to all the laboratory test results, carried out in the region in one place, for consultation by any health professional in the area.



“Hope” Covid-19 Project: Interoperable solutions in the context of the pandemic, which allowed, through interoperability, the traceability of COVID-19 patients exams’ results during the health crisis.



Terminology Services Project, whose objective is to be an enabler to improve efficiency in the management of clinical data that is exchanged both locally and nationally, through national and international standards.



SENAMA-MIDAS Project, which allowed information about the elderly that exists in different ministries to be shared, to know whether or not the patient was in a long term health institution.



CENS-Pharma Terminology Service, Terminology Server that hosts a highly standardized catalog of medications and pharmaceutical products at the national level, which avoids the ambiguities of pharmaceutical language.



Shared Medical History and the Shared Medical Account, are two emblematic projects that were worked at the beginning of CENS, from the Interoperability area with FONASA.



B-PRACISIS, a tool used to perform a diagnosis of institutional maturity, in order to incorporate or advance in a digital transformation or evolution program.



Electronic Medical Record Interoperability Project, developed with the Ministry of Health of Colombia, to implement and train territorial nodes for the Interoperability of their Electronic Health Records.



Electronic Clinical Record Quality Seal, which evaluates quality characteristics through systematized and standardized tools, measuring the dimensions of usability and security of these systems.



ECO-SD, the first Innovation Ecosystem in Digital Health, was born in 2024 and to date has already managed to add more than 16 health-providers institutions, startups, and enterprises in the country.



HL7 Chile was born as a national subsidiary of International HL7, thanks to CENS team impetus, which provides the sustenance and administrative support for the “Chilean Chapter” of the international health standards entity.



TEAM

CENS is made up of a multidisciplinary team of researchers and professionals in computing, engineering, and healthcare, mostly from universities that are leaders in the field of health information systems.





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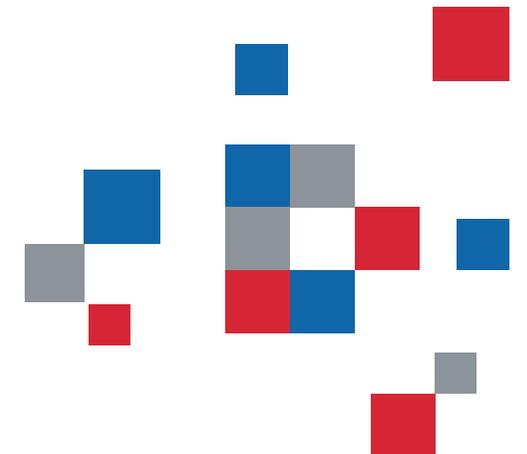
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CENS VOICES

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“We value the impact that CENS has had on the digital transformation of the health system in Chile. In these eight years, it has become a key player in the ecosystem and is currently a major contributor to the implementation of the Health Interoperability strategy developed by this Ministry, particularly in the Interoperable Waiting Times Project for the first primary care specialty consultation at the secondary level. We hope that our alliance will grow and strengthen in order to improve health in Chile”.

Ximena Aguilera, Minister of Health of Chile

”

“CENS work during these eight years represents an essential step in strengthening the capacities of the health sector in the Region. Collaboration with CENS has allowed us to advance in digital literacy and the development of public health competencies, objectives that we share with the World Health Organization and that are fundamental to strengthening information systems in the Americas. You can count on our support to continue working together on this mission”.

Marcelo D'Agostino, head of the Information Systems and Digital Health Unit in the Department of Evidence and Intelligence for Action in Health of the Pan American Health Organization



”



“It has been very significant for the Inter-American Development Bank to collaborate with CENS on emblematic projects for Latin America and the Caribbean, such as LACPASS. Thanks to this initiative, for the first time, we have seen that countries are prepared for cross-border digital health data exchange, opening up endless new possibilities. In addition, LACPASS has been key to making the Pan American Digital Health Route a reality. We are excited to continue working together”.

Jennifer Nelson, senior digital health specialist in the Health and Social Protection division of the Inter-American Development Bank (IDB)

CENS VOICES

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“During these eight years, the National Center for Health Information Systems has promoted health innovation in Chile, not only training professionals who are creating new solutions for our system but also generating and strengthening links between the public and private sectors. The work carried out by CENS, integrating the technology available in the country to face the great challenges of public health, has made it possible to bring these solutions to places where they did not reach before, directly benefiting patients and citizens”.

Walter Alveal Salgado, director of the Biobío Health Service

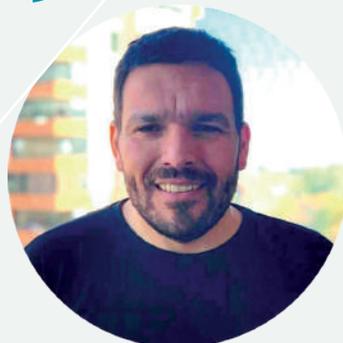
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“I thank the enormous effort CENS team makes in each project to articulate different actors and teams, and, above all, to encourage collaboration in an environment that is not always accustomed to cooperation. I hope that there will be many years in which we can continue to intend and work together, especially thanking their inclusion of less heard voices, such as those of patient organizations”.



Cecilia Rodríguez, Director of Participation and Incidence at Fundación Me Nuevo

”



“CENS 'work that has been done in these eight years is simply incredible. I feel very fortunate to have accompanied the Center since its beginnings and I am truly happy for everything that they have achieved. Thanks to you, hospitals, Family Care Centers and, ultimately, people, are accessing more digital health and innovation. This has been the fruit of tireless energy, moving forward in an environment that has often been challenging. My sincere congratulations to the entire team”.

Renato Pino, Founder & CEO at Snabb

A more inclusive and participative health

The building process of digital health requires moving for and with the users of the system. The dizzying technological advance forces us to change our perspective from the generation of “patient-centered” actions to one of solutions built with patients and other users of the systems.

As CENS, we believe in a future with involved and committed patients who master the technologies and understand their risks and benefits. People must have access to these tools, incorporate them into their daily lives, and thereby benefit from safe and reliable systems. We also hope to continue strengthening the dialogue between professionals and technicians in the health area and those in technology, advancing in the development and implementation of solutions with a clinical focus, which are used with a single purpose: to improve care and continuity of care.

To this end, we are committed to be a continuous contribution to the national and international ecosystem, through innovation, best software quality practices, training in technical and professional skills, promoting interoperability, and active monitoring of new technologies, which allow us to have clear institutions, regulations, and strategies, to advance safe and quality access to data by people.

Patients who do not have to get up early to ask for care, travel hundreds of kilometers to have a consultation or pick up their medications, carry bags and folders with their clinical history, and that health information can be used to do more predictive and preventive medicine, must be a shared dream. Technologies are not understood if they are not at people's service and must contribute to the process of humanization in healthcare.

Team CENS



THE FUTURE



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