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## Connecting Brazil's Children to a Healthier Future

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How a State in Northeast Brazil Is Using Collaboration  
and Cloud Technologies to Bring Virtual Pediatrics  
to Underserved Communities





# Connecting Caregivers to Children, Clinics, and Colleagues

## Overview

There are not enough pediatricians to care for the world's children. Pediatric subspecialists in particular are in short supply globally. Sergipe, a small state on Brazil's northeast coast, is addressing this problem by making underserved children a major focus of its healthcare efforts. Sergipe's officials and caregivers have partnered with Cisco to leverage the power of technology and the Internet of Everything to connect patients, doctors, and specialists, and to provide secure access to information and improve clinical workflow. This innovative pilot program is called Connected Healthy Children—Brazil.

## Healthcare Delivery in Brazil

Some 157 million Brazilians, about 75 percent of the population, rely on the country's publicly funded Unified Health System—Sistema Único de Saúde, or SUS—for their medical needs. Care is free and available to everyone, although about a quarter of Brazilians also have private health insurance. Secondary (specialist) and tertiary (complex and advanced) care is delivered through both private and public SUS providers and hospitals.

SUS supports approximately 6500 hospitals and more than 30,000 family health clinics. The vast majority of Brazil's cities and towns, as well as most rural areas, are served by family care teams administered

by the widely admired Family Health Program. Each family health team consists of a generalist doctor, a nurse, a nursing assistant/technician, community health agents, and sometimes other practitioners such as a dental specialist. One team serves a maximum of 4000 patients, with 3000 being the recommended number.



## Meeting Brazil's Public Health Challenges

Besides the inevitable financial constraints, Brazil faces several difficult healthcare challenges:

**Vast and populous:** Brazil is the world's fifth-largest country, with 203 million people and more than 3.2 million square miles (8.5 million km<sup>2</sup>) of territory. That is a very large area and public to serve. Adding to the difficulty is a diverse and sometimes isolating geography. In the Amazon Basin, for example, some remote settlements can only be reached by boat or plane.

**Not enough doctors:** Despite an increase in the number of medical school graduates, Brazil has a shortage of physicians. According to the World Health Organization, the country has only 1.9 doctors per 1000 residents. (By comparison, the number is 2.5 in the U.S. and 3.8 in Germany) As is the case in most parts of the world, Brazil's physicians are less numerous in rural areas and in the poorer city districts.



According to UNICEF, "Healthy children become healthy adults—people who create better lives for themselves, their communities, and their countries."





**Inconsistent geographic coverage:** Brazil's healthcare workers are not evenly distributed. There is a 230 percent higher concentration of doctors in the urban southeast than in the more sparsely settled north. That means a patient needing to see a specialist may have to travel a long way to a major city for treatment. The trip could take several hours each way, with a minor patient's family incurring significant travel expenses and time away from work.

**Shortfalls in pediatrics:** Local clinics are widespread in Brazil, but they mostly concentrate on primary care. Children under age 15 make up almost a quarter of Brazil's population, and they have different medical needs than adults do. Most physicians specializing in pediatrics reside in the population centers. It is unusual to find a pediatric subspecialist—such as a children's allergist, endocrinologist, gastroenterologist, or pulmonologist—practicing in the countryside.

**Underuse of technology:** Clinicians in rural areas usually cannot tap into the higher level of medical expertise and resources available in urban hospitals and medical centers. These clinicians could work more effectively if they had better access to the collaborative technologies enabled by advanced computer systems and the Internet. Without the ability to network, the clinics cannot take advantage of teleconferencing for remote consultations and other computer-based applications.

**Limited access to medical information:** Many diseases can be prevented or diagnosed more quickly if caregivers have easy access to the latest health information. But health awareness activities are rare in some of the more remote areas of the country. Health educational programs can be implemented much more quickly and cost effectively with modern communications technology.

### **Bridging the Children's Care Gap**

While Brazil's family health system is considered quite effective overall, the country is committed to meeting its healthcare challenges by reaching out to the underserved portion of the population, improving existing care, and implementing new technologies that empower caregivers and benefit patients. Brazilian officials also understand

the importance of expanding pediatric care and making sure children have unrestricted access to well-trained subspecialists. Healthy children are everyone's concern.

Based on existing healthcare gaps and Brazil's keen interest in remedying them, Cisco determined that Brazil would be a good fit for a Connected Healthy Children implementation. This program, which has already proved successful in pilots in the United States and China's Sichuan Province, leverages technology to improve the accessibility and quality of pediatric health services, while also enhancing collaboration and cultivating medical expertise. After a thorough evaluation process, the State of Sergipe was selected as a suitable location for the program.

### **Why a Special Focus on Pediatric Care?**

Early diagnosis and treatment of childhood illnesses is critical to the well-being of families and communities. According to the World Health Organization (WHO), approximately two out of every three deaths among children under five could be prevented with more effective primary care.

Untreated health problems may delay a child's development and impair the learning process. In addition, a chronically ill child can place a heavy financial and emotional burden on parents, interfering with work and domestic life. Furthermore, contagious diseases spread quickly among the young, fueling outbreaks that impact the community's collective health and welfare.

Children respond well to personalized care delivered by doctors who can relate to them and understand the best ways to keep them healthy. And just like adults, children need doctors with specialized training—known as pediatric subspecialists—to treat difficult conditions and acute illnesses.

But there is a worldwide shortage of these specialists, with many rural and even urban patients lacking access, or forced to wait weeks and travel long distances to see a practitioner. World health experts agree that building pediatric capacity should be a major healthcare goal for governments, nongovernmental organizations, and the private sector alike.



## Anatomy of an Innovative Healthcare Partnership

Cisco's vision is to change the way people work, live, play, and learn. We are always looking for ways to channel the company's talents, expertise, and partnerships to create sustainable and successful solutions to complex problems. Public-private partnerships have immense potential for building better communities by improving healthcare, education, and general well-being. When technology companies and government entities fully cooperate to identify and solve critical social issues, all stakeholders stand to benefit.



Among the program's partners are local municipal governments, including the municipality of Tobias Barreto.

Cisco Corporate Affairs works to empower global problem solvers with the skills and tools they need to speed the pace of social change. Take healthcare for example: When we harness the ability to turn connections into data, and then into knowledge, we can make it possible for citizens, patients, and professionals to prevent disease, to avoid or better manage health crises, and to save lives. The Internet of Everything—the intelligent connection of people, process, data, and things—combined with collaboration technologies allows people everywhere to get better access to quality care.

### Rigorous Evaluation Process

The Cisco Corporate Affairs team undertakes a detailed due-diligence process before going forward with a program. For Connected Healthy Children—Brazil, that evaluation included:

- Assessing opportunities for making a significant transformative impact on the local health system
- Undertaking a comprehensive discovery procedure by talking to potential partners

and reviewing demographic information, health statistics, and relevant reports and studies

- Identifying all the issues that need to be addressed by the potential solutions, including healthcare delivery gaps, obstacles to access, weaknesses in the infrastructure, and other factors
- Evaluating possible risks and prescribing actions to mitigate those risks
- Determining that there is a good match between Cisco's strengths and the pertinent issues
- Developing a plan that sets forth objectives, identifies use cases, describes approaches, and accurately anticipates capital requirements and operating costs
- Ensuring repeatability by detailing how the results are to be measured and reported
- Taking measures to make sure the program can sustain itself and grow after Cisco leaves the engagement





Cisco team members are convinced that a multidimensional analysis is absolutely critical to the success of an engagement. At the conclusion of the analysis, Sergipe, Brazil, was judged to be an excellent candidate for a Connected Healthy Children pilot program. Preliminary activities started in September 2012. The initiative was officially announced and launched on February 18, 2014.



## About Sergipe and the Partnership

Sergipe is the smallest of Brazil's 26 states, with an area of about 8500 square miles (22,000km<sup>2</sup>) and a population of just over two million. It is situated on the Atlantic coast in Brazil's northeast sector. The population is densest in the coastal regions, but a significant percentage of the population lives in agricultural areas in the interior.

### Connected Healthy Children: Four Key Goals

-  Enable increased access to pediatric care
-  Facilitate collaboration among practitioners
-  Disseminate medical knowledge and excellence
-  Support personalized medicine in the community

Many children in the outlying areas of Sergipe do not have easy access to pediatricians and pediatric subspecialists. Even in the small cities and large towns, children's doctors are scarce. For example, the inland municipalities of Lagarto (pop. 100,000) and Tobias Barreto (pop. 46,600) are located about 50 miles (80km) and 80 miles (130km) respectively from Aracaju, Sergipe's coastal capital. These places have no pediatric subspecialists, and the local clinics lack IT infrastructure that could connect them to physicians and other medical resources in the capital.

In early 2013, with a new Health Science Campus being built at the Federal University of Sergipe (Universidade Federal de Sergipe, or UFS) in Lagarto, the time seemed ripe for a public-private partnership aimed at using technology to extend pediatric medical practice from centralized facilities in the capital to underserved municipalities inland, such as Lagarto and Tobias Barreto.

The Connected Healthy Children initiative in Sergipe soon developed into a versatile, vibrant consortium, with the various partners offering unique sets of skills and resources:

- Cisco contributes world-class technology, networking expertise, and considerable experience managing projects of this type.



“ Connected Healthy Children brings benefits to all the children in our community. And the doctors in the clinic gain valuable knowledge that will help them in the future.

— Josefa Mary Costa Silva  
Manager of a Family  
Health Clinic in Lagarto, Sergipe



The Connected Healthy Children solution links critical information, people, and knowledge to improve the healthcare experience and make the delivery of care more efficient.

- UFS's Hospital and the new Health Science Campus provide specialized medical expertise for consultations and offer healthcare education programs delivered online. They also help interface with government entities. The Director



of the Health Science Campus, Dr. Mario Adriano dos Santos, worked with his team to help identify needs, coordinate partners, and launch the program.

- Family Health Program practitioners and health workers provide on-the-spot treatment and administrative services at the local clinics, and facilitate remote consultations. They also contribute their unique understanding of individual patients and the communities in which they live.
- Initiative sponsors also include the State Secretary of Health, Brazil's Ministry of Health, and the municipalities of Lagarto and Tobias Barreto.

All the participating individuals and organizations are united in their desire to fulfill Brazil's commitment to improved healthcare accessibility and services for all the country's citizens. Specifically, the program is devoted to positively impacting quality of life for children, whatever their health status. Ultimately Connected Healthy Children—*Brazil* could serve as the Latin American hub for an international children's healthcare network.

## Solutions That Showcase Transformative Technologies

Information and Communications Technology (ICT) is transforming how healthcare is delivered throughout the world. Solutions range from web-based teleconferencing and cloud-based multimedia medical databases to clinical workflow systems and sophisticated telehealth applications that allow physicians to examine and treat patients at a distance. A chief aim of the Connected Healthy Children program is to provide a technology showcase that teaches by example and inspires similar implementations in other regions and countries.

### Medicine's Digital Future: Telehealth

With the proliferation of high-bandwidth telecommunications, telehealth (also known as telemedicine) has taken root in healthcare systems worldwide. Telehealth, the delivery of medical care and information over the Internet, goes hand in hand with remote monitoring, interactive medical education, and similar advances. Sophisticated telepresence and conferencing technologies can sustain the doctor-patient relationship even when the parties are separated by many miles. The technology can in effect put a distant specialist in the room with the local caregiver. Telehealth also makes it easier for physicians to consult with each other and access vital information.

“ Our partnership with Cisco is a milestone for our research efforts and access to health services by the people in our state.

– Dr. Mario Adriano dos Santos  
Director of Lagarto Health Sciences  
Campus and Director of the Center for  
TeleMedicine Research, Universidade  
Federal de Sergipe







Cisco TelePresence creates immersive, face-to-face communication experiences and provides easy access to specialists at the point of care.

Telehealth yields many benefits for patients. Where doctors are scarce, patients can get care more easily. When patients and their families don't have to travel to see a physician, they save money and avoid absences from school and work. And it has been demonstrated that the quality of primary care improves in remote locations when "virtual" doctors can attend to patients. When implemented properly, telemedicine enables a collaborative approach that helps healthcare administrators make better use of their resources.

Collaborative care is distinct from the episodic care typically delivered by a single healthcare professional or organization because it enables caregivers to operate as a team. Using communications technology, the family doctor and the specialist can work together on a case, with the primary physician receiving direct feedback from a specialist consultation. That way, the primary physician is fully informed and the patient's case file can be updated accurately, in a timely manner.

Not only can specialists and subspecialists extend their practices with advanced technologies, but primary caregivers at the local clinics have an opportunity to enrich their medical knowledge by

working with the specialists. Clinicians can collaborate with their peers in other clinics. And they can take advantage of live and recorded education and training programs that are delivered online. Better utilization of all the resources available within the system results in more satisfied patients and a healthier community.

### Program Design Objectives

The Connected Healthy Children—*Brazil* program was designed with these major objectives in mind:

- Improve access to specialized children's healthcare from remote family health clinics using the latest collaborative solutions
- Implement continuing education programs and provide distance learning opportunities for medical professionals and the community
- Apply specific use cases that benefit the community and health system
- Establish centers of excellence at the University Hospital and other sites where pediatricians practice
- Provide a central portal for the program and services
- Leverage existing backend systems by integrating them with new services
- Take advantage of the strengths of local partners, particularly resources at the university, to add complementary value and help provide change management
- Solidify relationships with multiple levels of government to ensure sustainability and scalability
- Demonstrate the power of a public-private partnership to solve problems that cannot be effectively addressed by one of these sectors alone

The Build Phase plan for Connected Healthy Children—*Brazil* is summarized in Figure 1.

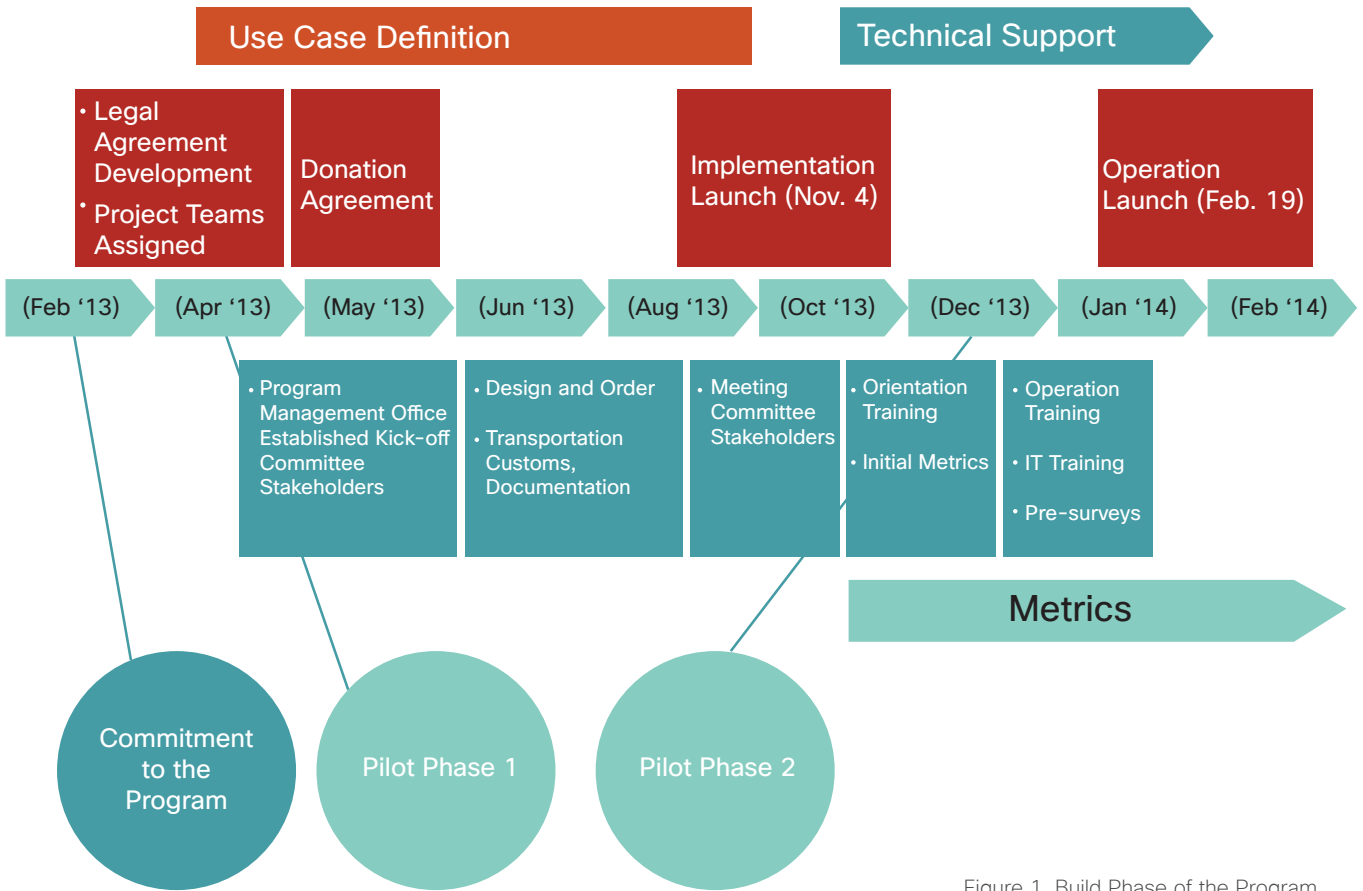


Figure 1. Build Phase of the Program

### Cisco's Connected Health Solutions

The doctor-patient relationship is central to medical practice and essential to high-quality diagnosis and treatment. Cisco's Connected Health solutions are aimed at improving patient engagement and enhancing healthcare collaboration with leading-edge enabling technologies. The chief elements of Connected Health are:

- Telehealth
- Videoconferencing
- Monitoring patient care
- Wellness care
- Patient web portals
- Integration with existing applications, practices, and workflows


Here are the key Connected Health technologies featured in the Connected Healthy Children—Brazil program:





**Cisco® TelePresence™:** Cisco TelePresence systems connect people across regional or global locations for treatment, consultations, training, and other types of collaboration. TelePresence products provide high-definition 1080p (2.07 megapixels per frame) video, three-dimensional spatial audio, and a network link designed to make it seem like people in physically separate locations are in the same room together. Cisco TelePresence creates immersive, face-to-face communication experiences, provides easy access to specialists at the point of care, makes it easier and more convenient for clinicians to collaborate, and improves both the timeliness and quality of care.






 **Cisco WebEx®:** This technology provides on-demand collaboration, online meetings, web conferencing, and videoconferencing applications on a variety of digital devices. Users can be located any place that has an Internet connection. The Cisco WebEx platform, delivered through a Cisco WebEx cloud, facilitates better communications, learning, and collaboration through a highly secure, integrated environment—a virtual team workspace, training center, and meeting center with single sign-on to support all collaboration tools and solutions. Cisco WebEx also reduces travel and costs associated with onsite medical education and application training.

 **Cisco Show and Share®:** This is an enterprise video portal application for webcasting and video sharing that helps organizations create secure video communities to share ideas and expertise, optimize global video collaboration, and personalize the connection with user-generated content. With Cisco Show and Share, medical educators can create live and on-demand video content, while specifying who has access to the programs. The application offers viewer collaboration tools such as commenting, rating, and word tagging, and it provides comprehensive access reporting.


 **Cisco Jabber®:** This software gives people the freedom to be productive from anywhere, on any device. With Cisco Jabber, users can access presence, instant messaging, voice, video, voice messaging, desktop sharing, and conferencing. Users can find the right people, see if and how they are available, and collaborate using whatever communications medium they prefer.

 **Cisco Unified Computing System (UCS):** Cisco UCS integrates computing, high-speed networking, storage access, and virtualization at the data center. The flexible, high-availability system reduces total cost of ownership and increases scalability by integrating the different components into a cohesive platform that can be managed as a single unit. Healthcare organizations can update and expand electronic medical records

“ The new virtual consultation model allows me to establish clear communications with the clinic doctor and the children’s parents. This results in better diagnostics and leads to the most appropriate procedure for the patient.

– Dr. Silvia Simões  
Allergy/Immunology Specialist,  
responsible for pediatric  
telemedicine consultations,  
Universidade Federal de Sergipe

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quickly and support critical clinical applications such as radiology and laboratory work, while minimizing network infrastructure size limitations and reducing the time needed to configure servers.

 **Cisco Extended Care:** This browser-based personal health and wellness collaboration platform enables pediatric patients and their parents to engage and interact with caregivers at any time, from anywhere. Families can make appointments online and also contact care teams for unplanned consultations. Features include instant messaging, real-time video conferencing, wellness information collection, Medical Education Learning content sharing, integration with third-party applications, and a high level of security.



### Primary Areas of Focus

The table below gives a simplified view of the project's major areas of focus, in terms of the objectives, related approaches, and enabling technologies.

Goals	Approaches	Technologies
Improve clinician-to-patient care	Use videoconferencing tools to connect patients and their caregivers at remote and rural family health clinics to physicians at the centers of excellence	Cisco TelePresence, WebEx, Jabber
Facilitate clinician-to-clinician collaboration	Use collaboration tools to connect medical colleagues so they can interact and confer	Cisco Unified Computing System, TelePresence, WebEx, Jabber
Enhance continuing medical education	Use videoconferencing and video creation tools to deliver instructional materials	Cisco TelePresence, WebEx, Jabber, Show and Share
Extend healthcare information and telehealth applications to the community at large	Use the system to support a public portal and extended care endpoints	Cisco Unified Computing System, Cisco Extended Care, cloud technologies, enabling applications

Telessaúde Brasil is a national program dedicated to promoting telehealth-enabled services and education. Connected Healthy Children solutions may be integrated with Telessaúde Brasil in the future, enabling the program to play a part in extending medicine-at-a-distance services, not only to Sergipe but throughout Brazil.

“ Telemedicine benefits the university in the areas of research and information gathering. But its role in the community is direct and important. It can serve a large number of children and other people where face-to-face visits aren't possible.

– Professor Angelo Antonioli  
Dean, Universidade Federal de Sergipe



### Where Services Are Delivered

With the pilot program in place, the children of Lagarto and Tobias Barreto have their medical appointments in family health clinics monitored in real time by specialists at the University Hospital in Aracaju. Medical teams can jointly assess each case remotely. The high-definition video and natural audio environment provided by the Cisco TelePresence equipment allows specialists and subspecialists to establish a personal rapport, putting the young patients at ease and facilitating diagnostics and treatment.

Figure 2 maps the networked sites in Sergipe and indicates the services provided at those locations. As shown in the illustration, there are two telehealth sites in Lagarto and two in Tobias Barreto. The core data center is located at UFS headquarters in São Cristóvão.



### Challenges along the Way

While rolling out the program, the partners encountered a number of challenges that limited the number of patients who could be served. These obstacles included a lightning strike that damaged equipment, a labor dispute that slowed shipments, elections that delayed government funding, and local changes in executive sponsorship. As a result, only 40 patients have benefitted from telehealth consultation to date—not as many as anticipated at the outset of the program. Even though the number of beneficiaries is currently below expectations, the program is now poised to support many more consultations, expanding to serve hundreds of patients in 2015.

“ Connected Healthy Children is not only applicable in Brazil, but also in other cities and countries in Latin America. It is very important for us to learn from this program so it can be replicated elsewhere.”

— Professor Angelo Antonioli  
Dean, Universidade Federal de Sergipe



## Locations and Core Services

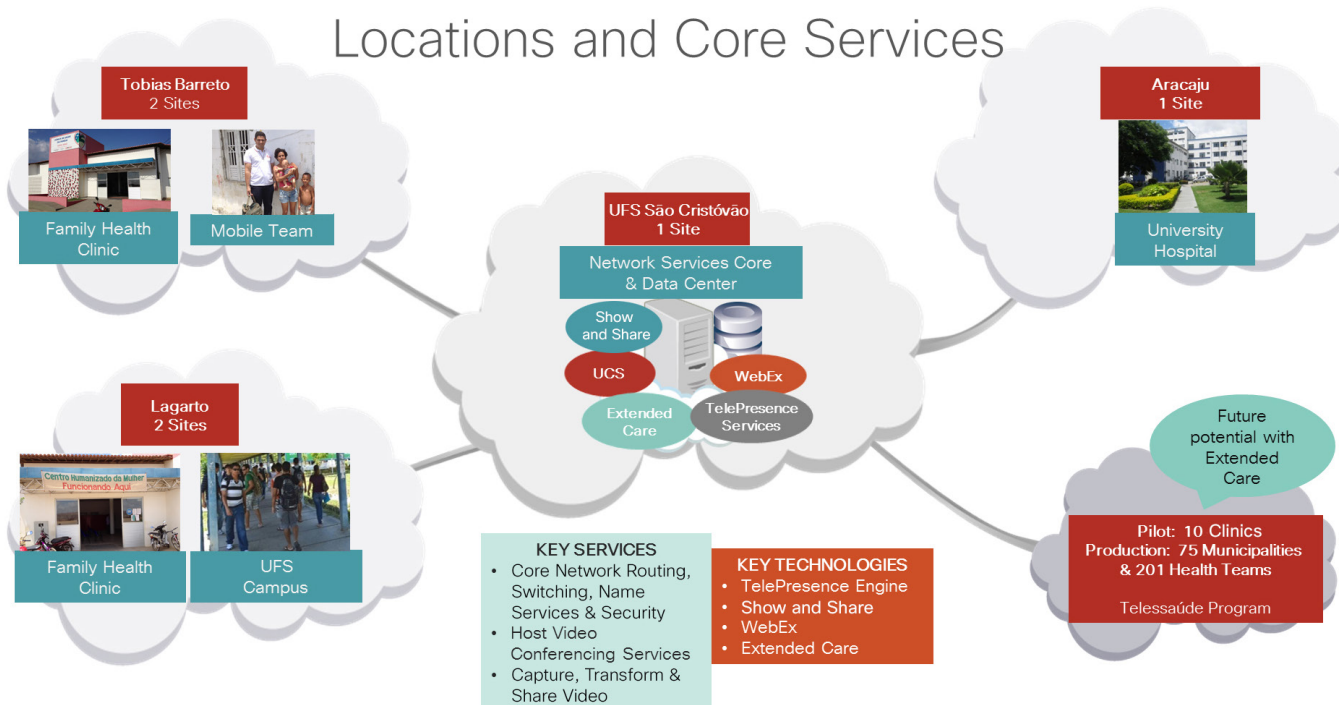


Figure 2. Locations and Related Services





### A Typical Specialist Consultation

Figure 3 shows how the pilot services work in practice, from both the patients' and the caregivers' point of view. Important aspects of the process include quick connections to the care team, secure messaging (SMS), anytime access to appointment information, electronic medical records, and surveys for quality control and evaluation.

As just one example, take the case of a two-year-old boy from rural Tobias Barreto who showed symptoms of urticarial (hives), an allergic reaction that can have

many causes. The boy needed to see a specialist to confirm the diagnosis and receive a treatment plan. Instead of making a two-hour, 80-mile (130km) trip to Aracaju for an office visit, the patient's family walked with him to a local family health clinic. There, using high-definition videoconferencing, a pediatric allergy specialist from UFS's Teaching Hospital conducted a real-time consultation. The doctor never had to leave the hospital, and the family avoided a stressful journey—saving travel time, travel costs, and missed work.

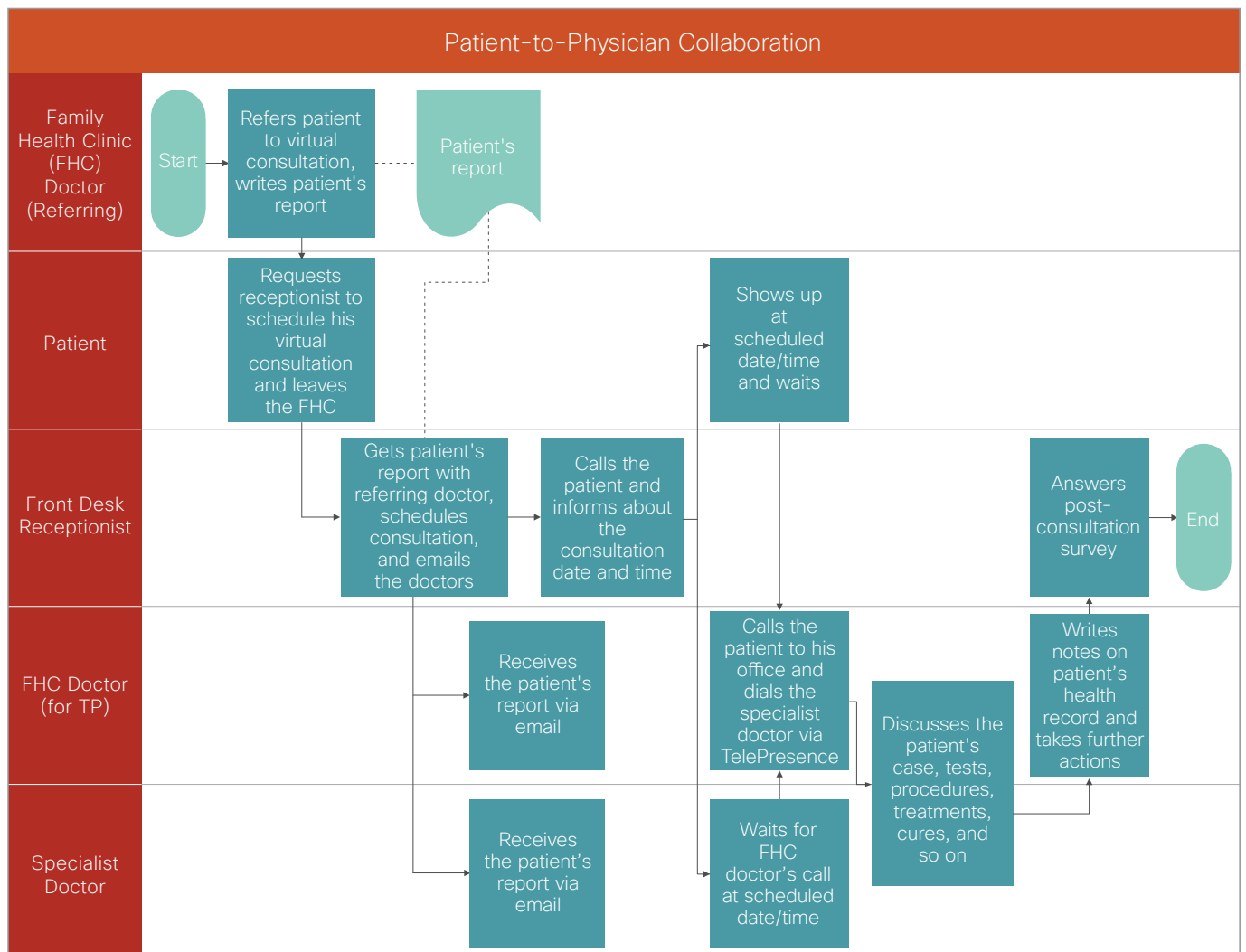


Figure 3. Steps in a Typical Consultation



Figure 4 shows the steps in a typical physician-to-physician collaboration involving a Family Health Clinic doctor and a patient.

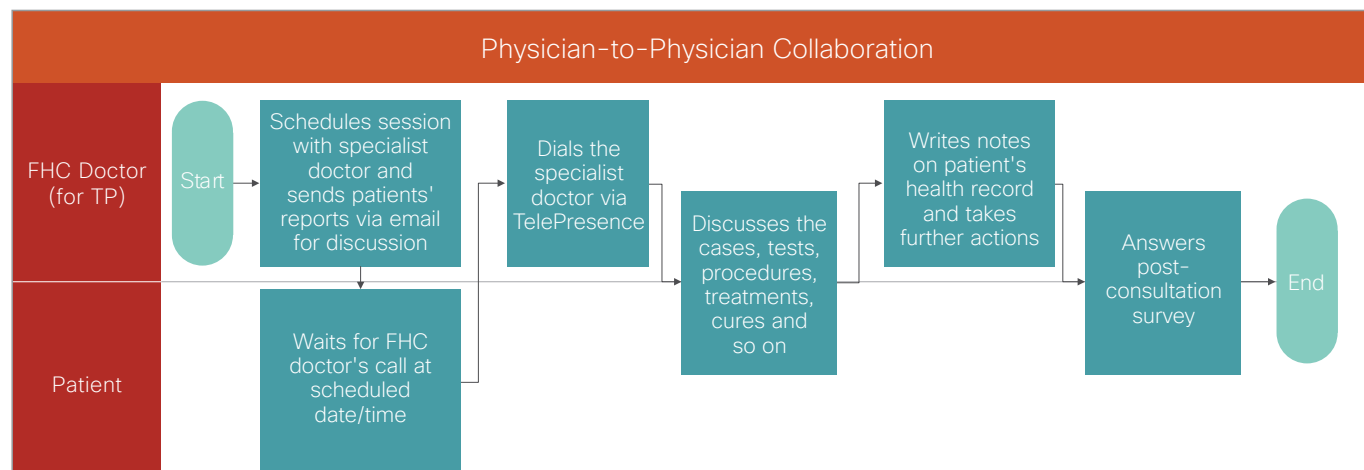


Figure 4. Physician-to-Physician Collaboration

Figure 5 depicts how the program helps health providers share knowledge and take advantage of online learning opportunities.

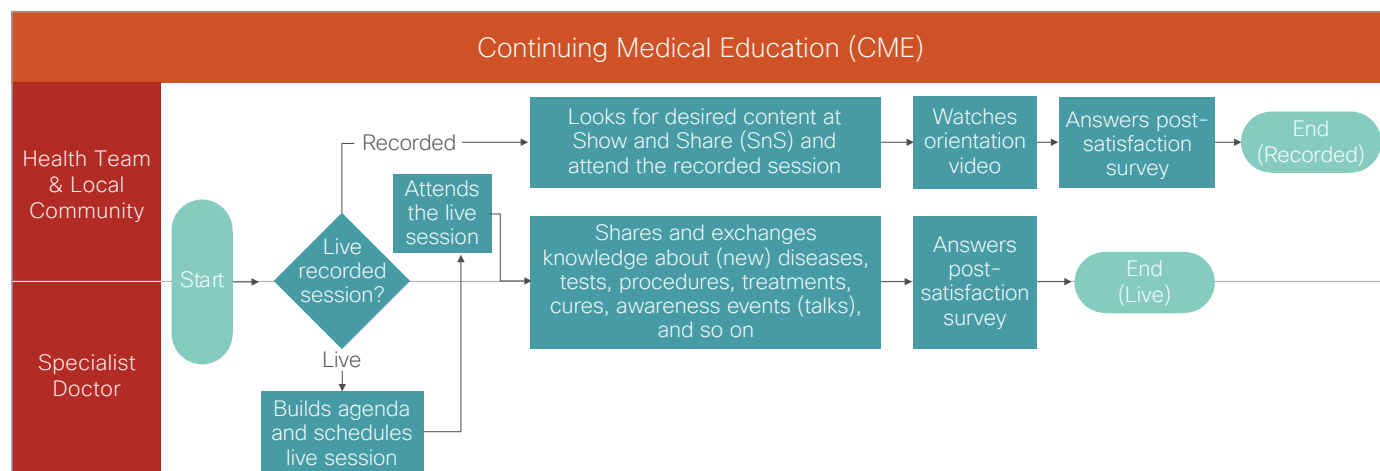


Figure 5. Continuing Medical Education (CME)

### Virtual Classrooms for Medical Instruction

With the network technology installed, members of the remote health teams are able to participate in live distance-learning sessions that enable knowledge transfers aimed at improving care. Clinic staff members receive instruction about health issues, diagnostic techniques, procedures, treatments, and healthcare events. Participants can ask questions and share experiences in a virtual classroom setting that

can accommodate a variety of educational media. Specialists and other subject-matter experts can use Cisco Show and Share applications to simplify the task of putting together and sharing a video presentation. To date, 60 students have completed Continuing Medical Education classes through distance learning.



One such session was held during Brazil's Allergy Week in April 2014. Dr. Silvia Simões and a team of allergists at UFS gave a presentation on asthma and rhinitis to clinic staff and members of the community in Lagarto and Tobias Barreto. The virtual seminar included a PowerPoint presentation, a video about what life is like for a child with asthma, and an interactive Q&A session. Approximately 30 people in Lagarto attended.

In addition to the live presentations, clinic staff can view on-demand recorded content at their convenience through the Cisco Show and Share application. A recent seminar on childhood obesity was archived in this way. To gauge the effectiveness of the recorded programs, users are asked to take a survey. These sessions can also be made available on public portals so regular citizens can get health news and learn about community health matters.



Dr. Mario Adriano dos Santos, an early champion of the Connected Healthy Children – *Brazil* program, heads the Center for TeleMedicine Research at Universidade Federal de Sergipe.



Sergipe is situated on the Atlantic coast in Brazil's northeast sector.

“ The Connected Healthy Children—*Brazil* partnership is building an innovative and transformative model for increasing access to specialized pediatric care for children in remote and rural communities.

– Laura Quintana  
Senior Director,  
Cisco Corporate Affairs







## Evaluating Progress and Ensuring Sustainability

Cisco's Corporate Affairs engagements are distinguished by two important requirements: ongoing evaluation of impacts based on metrics, and an emphasis on making sure that the transformations that occur can be sustained and expanded in the future. Preliminary information indicates that the program is working and is having a positive effect on healthcare at the clinics in Lagarto and Tobias Barreto.

### Methodology for Evaluations

In the design phase, the partners set up methodologies for gathering and analyzing information about how well the implementations are performing. The metrics also assess the social and economic impacts of the program.

The major methodology for these assessments is surveys. Caregivers, the parents of the patients, and administrators answer questions about their experiences with the system.

The questions are framed so that they align with the high-level metrics that the partners want to gather. The specialists are surveyed in a similar manner, starting a month after the program began and every other month thereafter. In addition, clinic managers are asked regularly to rate aspects of the program, while also furnishing information about their clinics for statistical purposes.

### Preliminary Survey Results

The post-consultation surveys enable the partners to get immediate feedback about the program and provide early measures of success.

The surveys measure:

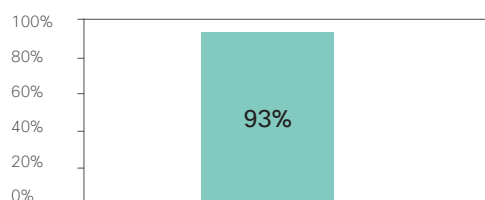
- Number of consultations
- Satisfaction/effectiveness of consultations
- Value of technology in providing better care, rated by physicians
- Whether access to specialized care has increased
- Whether efficiencies have improved for patients
- Whether quality of care has improved, rated by the patients' parents
- Whether participants would recommend telehealth to others
- Comparison of virtual consultations to in-person consultations
- Demographic information



Many of Brazil's regional hospitals, like this one in Lagarto, are not staffed with a full complement of pediatric specialists and can therefore benefit greatly from telehealth programs.

Results of the surveys are shown below. Between 26 and 28 patients responded to each question.

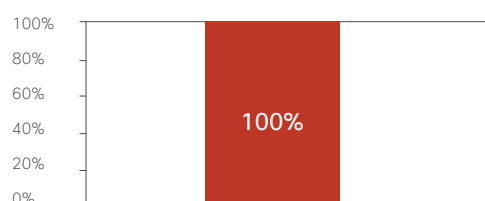
### Effectiveness of Virtual Consultations



Effective/ Very effective

Ninety-three percent of respondents rated their consultations "effective" or "very effective."

### Satisfaction with Virtual Consultations

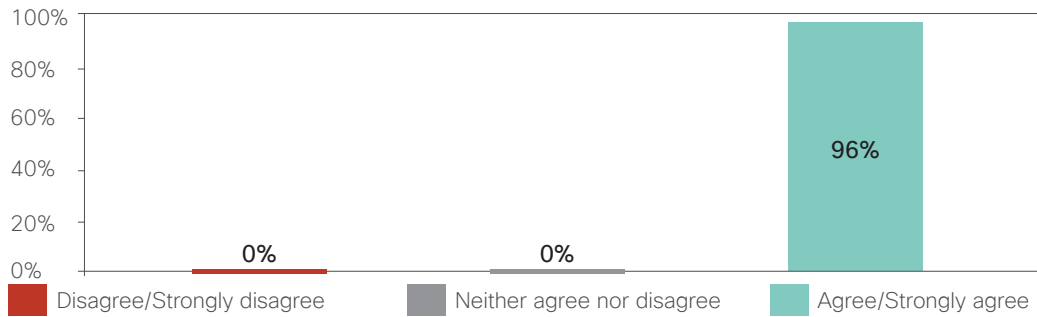


Satisfied/ Very satisfied

All the respondents indicated that they were "satisfied" or "very satisfied" with their virtual consultation.

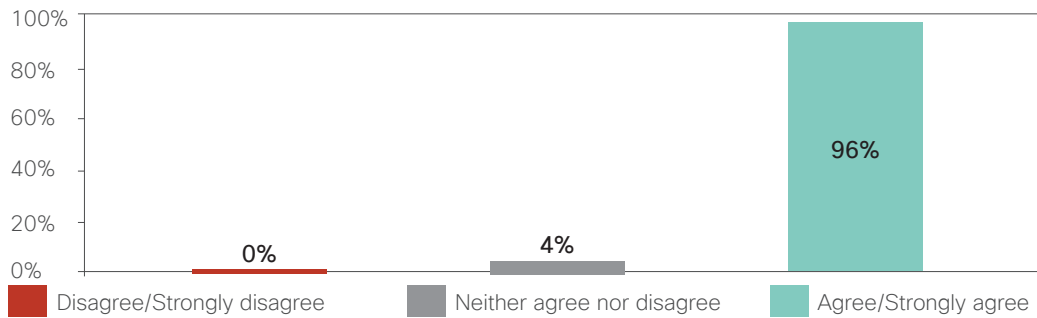


### Reduction in Travel Time



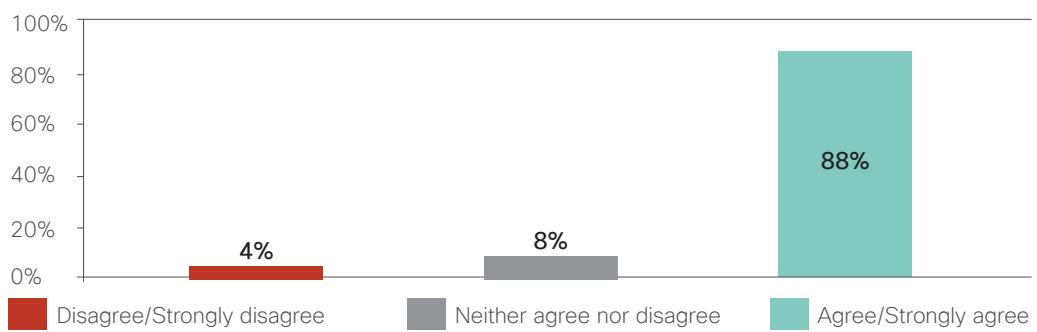
Ninety-six percent of the patients said they “agree” or “strongly agree” that virtual consultations have reduced the travel time needed to access specialized care.

### Reduction in Costs



Ninety-six percent of the respondents also said they “agree” or “strongly agree” that the cost burden on their families was reduced by the Cisco TelePresence technology.

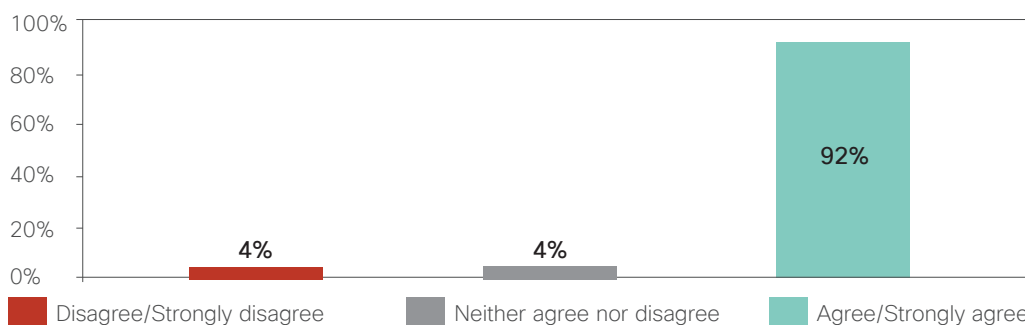
### Access to Specialized Care



Eighty-eight percent of the respondents said they “agree” or “strongly agree” that they now have better access to specialized care at their local clinic.

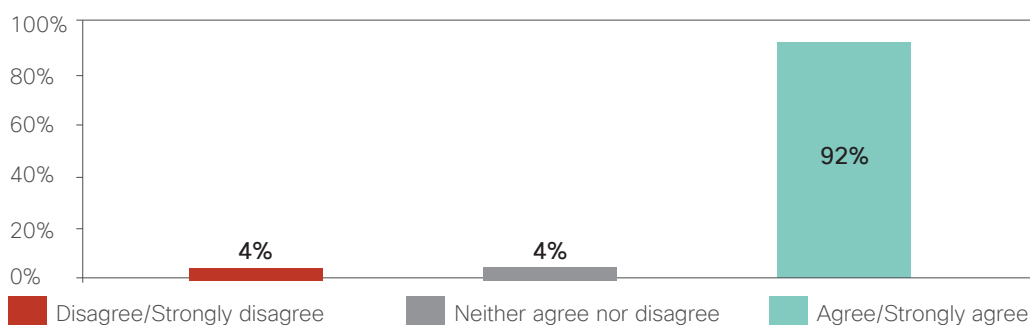


### Recommend Telehealth to Others



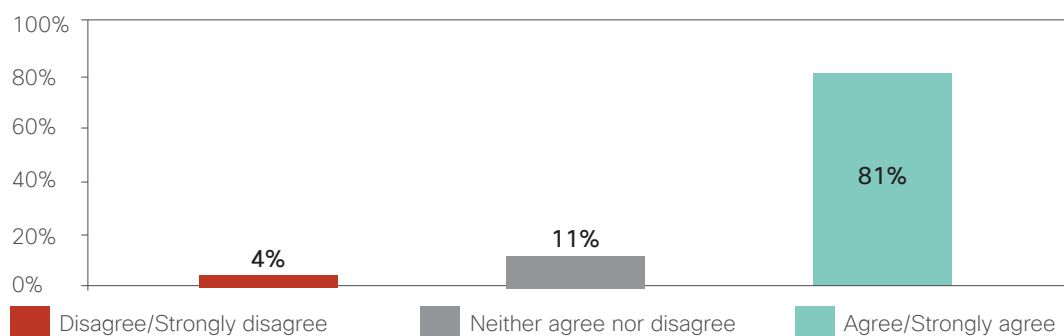
Ninety-two percent of the respondents “agree” or “strongly agree” that they would recommend the telehealth experience to other family members.

### Quality of Care



Ninety-two percent of respondents “agree” that telehealth improves the quality of care they receive at the clinic.

### Virtual vs. In-Person Appointments



Eight-one percent (22) of the 27 respondents said they “agree” or “strongly agree” that a virtual consultation is as good or better than an in-person consultation. Three patients were neutral and only one had a negative impression. (One chose “not applicable.”)





## Sustaining and Scaling the Transformations

From the beginning, one of the major goals of Connected Healthy Children–Brazil has been to leave a legacy of improved care by making sure the program can be sustained over time and can increase in scope.

Specifically, program sustainability means:

- Ensuring that operational standards and practices are in place
- Measuring, reporting, and sharing best practices
- Securing government commitment before the start of the engagement
- Promoting scalability by integrating operations with other Brazilian telehealth programs
- Transitioning ownership of the services to UFS and government entities at the end of the engagement

Part of the scalability effort is to attract an increasing number of specialists to the program, first in Sergipe and then in other states. This should happen as more physicians learn about the program and its advantages. Program participants will work to align the program with Telessaúde Brasil, the countrywide telehealth initiative, and UNA-SUS, the Unified Health System's Open University program for medical distance education, to help roll out high-quality telehealth programs across the country. Eventually the stakeholders hope to use the program as an international proof of concept, encouraging other Latin American countries to start similar pediatrics initiatives.

Looking to the future, the technology has the potential to deliver a host of advanced healthcare capabilities. For example, extended access would allow caregivers to use the system when traveling or at home. Application integration for data transmission would permit faster access to all types of patient information in the clinical workflow. And teleradiology applications would let specialists quickly view, share, and archive patients' medical images.



Connected Healthy Children–Brazil received the 2014 AREDE award for social impact.

## What Comes Next?

Encouraged by the progress they have seen so far, the partners are eagerly looking forward to the coming year. They will continue to measure, tune, and optimize the services, based on the metrics derived from the surveys and other input. As participation increases and more results come in, the partners will be able to assess impacts with greater precision. In addition, a government impact study is planned for late 2015.

Transfer of the program to a Governing Board, comprised of stakeholders from the program's various entities, will be completed by May 2015. The board will review future progress on a regular basis and take action to resolve any emerging issues. A partnership agreement between the Brazilian government and UFS is expected to formalize integration with Telessaúde Brasil and UFS TeleMedicine programs. To learn more about Connected Healthy Children–Brazil, watch the video: <https://youtu.be/dZpu3EatpyM>

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