Collaborative Children's Healthcare: Cisco CSR's Focus on Global Child Health Initiatives

Children's Healthcare

The well-being of children is absolutely essential to creating vibrant and prosperous societies long term. As UNICEF states, "Healthy children become healthy adults: people who create better lives for themselves, their communities, and their countries." Moreover, sick children can exact a heavy toll when it comes to their families' time and resources. The adults may be drawn away from their jobs and other responsibilities, placing a heavy burden on the community and local economy.

Children's health is improving almost everywhere, but serious challenges still remain. Even in developed countries, many children do not get optimal pediatric care because they live where physicians are scarce and modern medical infrastructure does not reach or provides only spotty coverage. More extensive health systems, more intensive implementation of enabling technology, and a larger force of well-trained pediatric caregivers are crucial for ensuring that the world's children stay strong and well.

Cisco CSR excels at focusing on important humanitarian goals with engagements that make innovative use of Cisco's technical solutions and expertise. Cisco CSR can make a substantial global impact by leveraging Cisco technologies to improve children's health, with the potential to benefit a spectrum of communities now and in the future.

Together with education, economic development, and critical human needs, Cisco has identified healthcare as a key target for the company's Corporate Social Responsibility (CSR) engagements. Collaborative technologies are crucial for linking medical providers with patients and colleagues in underserved communities.

Cisco's connected collaborative environment can provide the connective tissue for global communities of social change agents, playing a vital role in helping Cisco realize its CSR objectives in the healthcare sector. This holistic approach to collaboration may be combined with cloud technologies that have the power to improve care by strengthening medical infrastructures, centralizing healthcare services, and providing better access to health records.

Children's health is critical for maintaining healthy populations and communities worldwide, but often suffers from limited accessibility, even in wealthy countries with otherwise exemplary healthcare infrastructures.

Cisco and Healthcare

Cisco is a global leader in providing networked technologies that improve virtually every facet of healthcare. Cisco® technologies benefit all healthcare stakeholders: patients, physicians, hospitals, payers, and related organizations. And Cisco CSR has a history of giving back to improve global communities. Our CSR initiatives focused specifically on children extend the company's involvement to a critical subset of healthcare, one where the need is great.

With Cisco collaboration products and information sharing based on cloud-enabled technologies, healthcare organizations can lower the costs of delivering care while significantly improving medical outcomes. Specifically, Cisco's HealthPresence®, TelePresence®, and WebEx® collaborative technologies extend the reach of scarce subspecialists, increase the productivity of existing resources, and build healthcare capacity.

CISCO™

These telehealth technologies offer:

Benefits for Patients:

- Allowing patients in underserved areas to access healthcare without having to travel long distances

- Providing real-time management of critically ill patients by remotely located specialists

- Providing a higher degree of accuracy in diagnoses due to collaboration with other physicians

Benefits for Providers:

- Eliminating the physician's need to travel to partnering clinics for consultations

- Enabling medical knowledge sharing and collaboration with other physicians

- Allowing specialists to increase the volume of first-time patient visits and follow-up consultations

- Establishing valuable links to nurses and support staff that streamline workflow

- Enabling researchers to collect study data from groups of unconnected providers

- Providing a convenient conduit for health education and training

From the patient's perspective, care-at-a-distance technologies save families time and travel expenses, and decrease the time to first consultation. In addition, today's children have a strong affinity for video communication. They are often more comfortable with this technology than their parents are. Physicians have discovered that some children are actually more responsive in the examination room if they are engaging a video screen rather than a care provider in person. (This is especially true of children with autism-spectrum disorders, which have become increasingly common in the United States.)

In addition to telehealth advantages, the installation of medical-grade networking equipment can dramatically improve operational efficiency, clinical workflow, and hospital management. The Cisco Medical-Grade Network promotes faster care delivery by giving medical personnel access to information when and where they need it. It improves patient satisfaction by helping to reduce wait times and streamline patient care processes, and enables flexible wired and wireless communications. The network also optimizes technology investments by fully integrating with existing systems and applications, and minimizes costly downtime with self-healing capabilities.

Caregivers, such as hospital floor nurses at central stations, can get quick access to patient status information like laboratory tests and pharmacy services over the network. Electronic health records help ensure continuity of care and reduce medical errors. And automated facilities management makes the buildings more energy efficient.

Furthermore, regional healthcare clouds can connect towns and villages to full-service hospitals and multiple tiers in the national health infrastructure, including children's hospitals and pediatric specialists. In this way, the healthcare hierarchy can extend from local clinics or mobile units all the way up to service centers, county hospitals, and high-end urban medical centers. This facilitates both treatment and professional training.

Cisco Community Knowledge Centers—implemented with partners Appleseeds Academy, Inveneo, and One Global Economy—have already contributed to economic and community development in countries such as Ethiopia, Kenya, Lebanon, Mexico, and Israel. These web-based centers can also be used to reach out to communities with health information and pediatric education. What's more, the global reach of Cisco Networking Academy® can be leveraged to help provide the local technical expertise that is essential to installing and operating medical-grade networks.

Finally, an enhanced CSR healthcare profile can effectively integrate employee volunteerism. For example, Cisco employees would have the opportunity to contribute their time and energy to a local area pediatric hospital to which they may have community and personal ties.

Why Focus on Children's Healthcare?

About two out of every three deaths among children five years and younger can be prevented with effective primary healthcare, according to the World Health Organization (WHO). The United Nations' Millennium Development Goal #4 calls for reducing child mortality worldwide by two-thirds before 2015. WHO estimates that in the time remaining we could prevent the deaths of more than 15 million children under five, including 3 million newborns. An additional 88 million children could avoid stunted development and 120 million more could be prevented from developing debilitating pneumonia.

The **Journal of the American Medical Association (JAMA)** notes that children often get acute, short-term illnesses such as upper respiratory tract or ear infections, gastrointestinal illness, or injury-related problems that should be treated immediately. But less pressing health problems must also be addressed early. "Some children develop chronic illnesses that last for years or even a lifetime, the result of genetic (inherited) conditions, environmental factors, or a combination of both," according to JAMA. "Regular medical care is important for all children to increase the chance that a chronic disease is diagnosed and treated early, lessening the overall impact on the child and family."

The well-being of children is absolutely essential to creating vibrant and prosperous societies long term. As UNICEF states, "Healthy children become healthy adults: people who create better lives for themselves, their communities, and their countries." Moreover, sick children can exact a heavy toll when it comes to their families' time and resources. The adults may be drawn away from their jobs and other responsibilities, placing a heavy burden on the community and local economy.

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reach or provides only spotty coverage. More extensive health systems, more intensive implementation of enabling technology, and a larger force of well-trained pediatric caregivers are crucial for ensuring that the world's children stay strong and well.

An Alarming Shortage of Pediatricians Worldwide

Many areas of the world suffer from a lack of doctors concentrating on children's health, and this includes parts of the United States. Rural regions and areas with fewer healthcare training programs have the largest shortages. Besides a dearth of general pediatricians, there is also a scarcity of pediatric subspecialists who focus on orthopedics, oncology, cardiology, psychiatry, and other medical specialties for which additional training is required.

For example, China has an estimated shortage of 200,000 pediatricians, the **Beijing Times** reported earlier this year. The number of pediatric doctors in China increased by only 5000 in the past 15 years, and the current number of pediatric hospitals accounts for only 0.52 percent of total hospitals in China.

The French health system is also struggling to cope with a shortfall in pediatricians, attributed to the fact that not enough graduates are replacing those who retire. The Association Française de Pédiatrie Ambulatoire has determined that there is only one pediatrician for every 6000 children in France. Among western European countries, even affluent Norway and Sweden report shortages in some regions. In the Mideast, there is a lack of pediatricians in countries ranging from Armenia to Israel. Most developing countries in Africa have a severe shortage of physicians of all kinds.

A recent **Time** magazine article reported a similar shortfall in the United States: "There are 15 million children—20 percent of kids in the United States—who live in areas where child healthcare is plentiful. But another 15 million live in enclaves in nearly every state where the ratio of pediatricians and family physicians is 22 for every 100,000 kids. That's a patient load of more than 4500 kids per doctor." Even when entire states are considered, the discrepancies can be dramatic. One study based on 2000 census data found that New York had a child-to-pediatrician ratio of 1068:1, while in Idaho the ratio was 4280:1.

As the number of children with special or chronic healthcare needs increases, so does the demand for subspecialty care. Pediatric subspecialists are pediatricians who have received training in specialties such as dermatology, endocrinology, neurology, and pulmonology. In the United States they must complete an additional three to five years of subspecialty training in addition to three years of pediatric residency, four years of medical school, and four years of college.

The ready availability of pediatric subspecialists is fundamental to children's health. For example, childhood obesity is rising in the United States, and with it an increase in childhood diabetes, a condition that is most appropriately managed by pediatric endocrinologists. If not treated early, such chronic conditions can result in significant complications and illnesses that affect the child in adulthood. Studies have also found that subspecialists improve the quality of care, lower complications, and decrease medical costs through more effective treatment and shorter hospital stays.

Many medical organizations want to recruit subspecialists, but they are having limited success because there simply aren't enough to go around. The American Medical Association estimates there are only about 27,400 pediatric subspecialists in the United States, and that number includes doctors who are not actively caring for children because of administrative
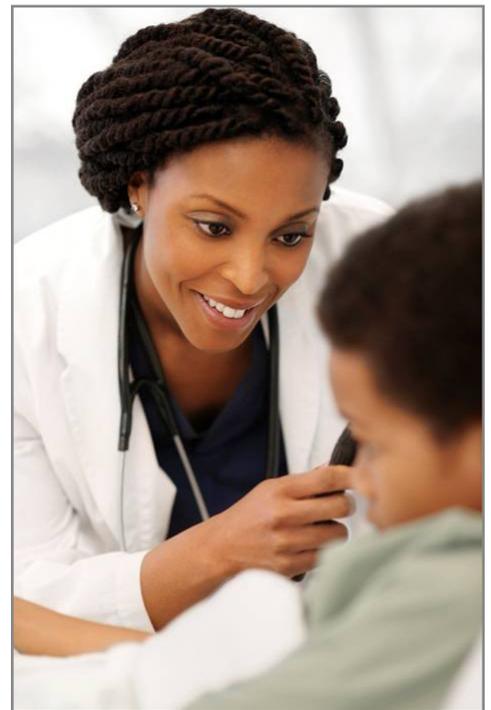
duties or academic appointments, as well as others who do not work full time. Sixteen states have less than one pediatric subspecialist under age 65 per 100,000 residents, according to the National Association of Children's Hospitals and Related Institutions (NACHRI). A recent U.S. Government Accountability Office (GAO) report found that 84 percent of physicians treating children insured by Medicaid or the Children's Health Insurance Program had "great" or "some" difficulty making referrals to subspecialists, and 26 percent of physicians treating privately insured children had equal difficulty.

This paucity of both general and specialist pediatricians means that families must often travel to a distant pediatrics center for care, placing even greater emotional and financial strain on already overburdened parents. For instance, the mean distance that patients travel to see pediatric neuro-developmental specialists in the United States is 73 miles. In some cases, entire families may be uprooted if parents decide to relocate to another community to be closer to an appropriate physician or hospital. As an alternative, children may have to receive care from adult-medicine practitioners who do not have the training to treat them effectively.

Even in places with no shortage of pediatricians, patients often face long lead times to obtain an appointment. In 2010, NACHRI reported on the length of time patients had to wait to obtain subspecialty appointments in the United States. For 10 subspecialties[1], patients had to wait longer than five weeks for an appointment. Worse still, patients endured wait times of more than 10 weeks to see developmental pediatricians (who treat behavioral disorders such as autism and learning problems), dermatologists, and endocrinologists.

The American Academy of Pediatrics (AAP) actively advocates that policymakers address the pediatrician shortage. Among their recommendations is that AAP state chapters explore how health information technologies such as telemedicine may be used to enhance delivery of pediatric care by general pediatricians and pediatric subspecialists in shortage areas.

Targeting Childhood Diseases

Worldwide, the major causes of death among children one month to five years of age are pneumonia, diarrhea, malaria, measles, and HIV, according to WHO. All these diseases can be ameliorated or prevented with regular pediatric care. Pneumonia is the prime cause of death in children under five, with nearly three-quarters of all cases occurring in 15 countries. One African child dies every 30 seconds from malaria. Over 90 percent of children with HIV are infected through mother-to-child transmission, which can be prevented with antiretrovirals. (About 20 million children under the age of five are severely malnourished—leaving them more vulnerable to various illnesses and early death.)

The following diseases are most common among children in the United States, according to JAMA.

- **Asthma:** The number of children with asthma increases each year. Better treatment for asthma reduces the chance of hospitalization, need for emergency treatment, and death.

- **Cystic fibrosis:** An inherited lung disease for which there is no cure, cystic fibrosis can be treated more effectively if it is diagnosed early.

- **Diabetes:** Having diabetes (either type 1 or type 2) causes increased risk of heart and blood vessel disease, stroke, and diabetes-related complications at an early age.

- **Obesity:** Overweight children represent a major public health problem in the United States. More children are overweight, obese, or morbidly obese than ever before. Many children who are overweight maintain their obesity as adults, leading to complications such as diabetes, heart disease, high blood pressure, high cholesterol, stroke, some cancers, arthritis, and sleep disorders.

- **Malnutrition**: Poor nutrition results in maladies such as inadequate immune system function and intellectual

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1   These subspecialties include developmental pediatrics, dermatology, endocrinology, neurology, pulmonology, orthopedics, urology, nephrology, rheuma-tology, and gastroenterology.

development problems.

- **Developmental disabilities**: These include attention-deficit/hyperactivity disorder (ADHD) and the autism-spectrum disorders. Early diagnosis and treatment helps mainstream the affected children.

- **Mental illnesses:** Early diagnosis and treatment are important in decreasing the effects of early mental illness and attendant behavioral problems on childhood development.

- **Cerebral palsy:** Better prenatal and neonatal care can help prevent this spectrum of disorders that causes physical disabilities and motor control problems.

- **Prematurity and low birth weight:** These conditions can result in chronic lung disease, retinopathy (an eye disorder), and developmental delays. Skilled intervention is critical.

Cisco's Current Children's Care Portfolio

Children's healthcare projects provide Cisco with the opportunity to leverage the company's healthcare solutions across the continuum of care, with initiatives aimed at both patients and healthcare providers.

Post-Acute Medical/Surgical Care

Cisco CSR is currently deploying a Cisco HealthPresence pilot in Northern California. The pilot connects a pediatric urologist at Lucile Packard Children's Hospital at Stanford (Palo Alto) with an attendant nurse practitioner at the Pediatric Group of Monterey located 83 miles to the south. This telehealth engagement demonstrates pediatric outpatient medical care and post-surgical follow-up at a distance.

Collaborative Capacity

Collaborative healthcare capacity building takes many forms. As one example, Cisco Community Knowledge Centers promote scalable and sustainable models of community development in several African countries and elsewhere, offering courses in information and communications technology (ICT), entrepreneurial, and language skills, and providing community access to websites that offer health information, among other resources.

Cisco partners with Norwegian non-governmental organization (NGO) Deaf Aid to help deaf youth develop valuable IT knowledge and skills. By combining Deaf Aid activities with the Community Knowledge Center model, Cisco can extend childhood deafness prevention efforts with awareness programs. In addition, Cisco currently supports a Deaf Aid Mobile Hearing Clinic in Kenya, an outreach program that works to identify and treat children with hearing loss due to disease before they experience permanent deafness. Using the mobile unit, physicians in the Kawangware slum near Nairobi are able to consult with specialists at Niarobi's Menelik Hospital over a Cisco TelePresence link.

Cisco CSR program, Connecting Sichuan, piloted a number of capacity-building efforts aimed at improving clinical effectiveness

by installing high-bandwidth, medical-grade networking equipment. At the newly built Chengdu Women's Children Hospital, integrated digital media solutions were integrated with traditional clinical ICT applications, enabling better collaboration between departments, staff, and patients. The Chengdu Women and Children Care Network makes use of Cisco collaboration tools to strengthen healthcare in the cities of Pengzhou and Dujiagyan by networking two tertiary hospitals and four county hospitals to the Chengdu Women and Children Medical Center.

The Jordanian government and Cisco have collaborated to create a telehealth network that connects rural patients to specialist physicians at an urban hospital. Using Cisco HealthPresence technology, specialists in cardiology, nephrology, and dermatology at Prince Hamzah Hospital in Amman consult with patients and physicians at rural Al-Mafraq Governmental Hospital (MGH) in northeast Jordan. Cisco HealthPresence also uses the network as the platform and intelligent routing to provide real-time information exchange by connecting medical devices—including thermometers, blood pressure cuffs, multipurpose scopes, stethoscopes, and handheld cameras. The Jordan Healthcare Initiative supports specialized healthcare for patients of all ages, including but not limited to children.

Project Samudaya in India exemplifies a successful public-private partnership capacity-building model that has transformed five flood-affected villages into a connected and sustainable community enabled through collaboration technology. Cisco helped implement a primary healthcare center in Gillesugur that provides remote healthcare to patients in the area by connecting them to doctors and specialists located at Raichur Institute of Medical Sciences (RIMS), the district hospital in Raichur. This engagement offers the opportunity to make pediatric care an integral part of the remote healthcare solution.

Rehabilitation Care

Prior to the Sichuan earthquake, Wenchuan People's Hospital was a struggling community-level hospital primarily serving residents in Wenchuan county. After implementing Connecting Sichuan's healthcare ICT solutions, the hospital now attracts patients from outside the area by offering new services including post-heart-surgery rehabilitation, a service typically only available in academic medical centers in larger cities.

Education and Training

It used to take caregivers at Wenchuan Women and Children Hospital at least three days to travel to all 13 township health centers in Wenchuan to conduct training on the most recent care guidelines. With the new telehealth network in place, they managed to train the township health centers staff in a single session that took only three hours.

Cisco launched HealthPath to provide online education for clinicians. An inaugural course called **Meaningful Use of EHRs: First Steps to Improved Patient Outcomes** helps physicians and nurses implement electronic health records in small- to medium-size clinics. Future projects could expand the company's health education portfolio to provide wellness and prevention education for children and their families, as well as for the care providers who serve them.

Cisco will be able to leverage the company's considerable educational infrastructure, including the global resources of Cisco Networking Academy, to help make the ICT training needed to run medical networks available to underserved communities.

Current Cisco Healthcare Engagements

The map below indicates the locations of healthcare initiatives that Cisco is already engaged in throughout the world. Communities being served are situated in the United States (California and Georgia), Jordan, Kenya, India, and China. We can build on these engagements with an eye toward strengthening pediatric caregiving in many communities, at multiple levels.

How Will We Measure Success?

Evaluation metrics are specific and measurable indicators that are tied to program objectives, and provide quantitative measures of program success. Ultimately, CSR programs are successful when sustainability is achieved—by definition this implies that the long-term maintenance of responsibility for the program is carried forward by the local communities benefitting from the initiative, with extended impacts on the economic and social well-being of the citizenry. By evaluating data throughout the implementation and post-implementation process we can understand the impacts in a sustained fashion.

Our Partners

Cisco partners with a wide array of organizations in our healthcare endeavors—ranging from national, provincial, and local governmental entities, to NGOs and community-based groups, to medical and networked technology companies, to educational and research institutions. We also partner with telecom providers in various countries to provide broadband services. This framework of partnerships is poised to support Cisco's pediatric initiatives, just as they do adult medicine.

The healthcare component of Connecting Sichuan has been the largest Cisco CSR healthcare initiative to date. As part of this public-private partnership, Cisco worked closely with Chinese authorities to align Connecting Sichuan healthcare initiatives with China's Health 2020 reform plan, which calls for using technology to increase access to healthcare and improve quality of care in rural communities. There were 11 healthcare partners in all. The pilots were designed and delivered by several partners, including the Sichuan Department of Health, the Provincial People's Hospital, West China (Huaxi) Hospital, StandTALL, and the Youth Foundation. Connecting Sichuan represents a useful template for partnerships in the children's healthcare arena.

Apropos public-private partnerships, Cisco recently announced the launch of a healthcare solution pilot in collaboration with Government of Madhya Pradesh in Sehore, India. In Phase l, community/primary healthcare centers in Sehore and Gwalior will be connected to a district hospital in these locations so patients will be able to access basic medical treatment and specialist consultations remotely. Such pilots can easily serve as a basis for remote, dedicated pediatric care.

Cisco is fortunate to have relationships with many leading healthcare providers in the United States. Some of these providers have reached out to Cisco with ideas for how technology can improve healthcare for their patients. To be specific, in 2010 Cisco entered into a groundbreaking telemedicine pilot program initiative with Molina Healthcare, two community health centers in San Diego, and the state of California to provide health and wellness services to underserved communities throughout the state. More than 15 sites have been equipped to deliver telemedicine primary and specialty care services using Cisco HealthPresence.

Save the Children, the leading independent organization creating lasting change for children in need, serves some of the poorest and least-served children in the United States and around the world. Through the Cisco Foundation, we support Save the Children's global efforts to ensure children are safe, educated, healthy and better able to attain their rights.

How Do We Make Our Efforts Sustainable?

A prerequisite for sustainability of CSR-led healthcare pilots is end-user commitment. After a pilot has been launched, the end user organization must take ownership and commit the resources required to fully integrate the technology solution into ongoing operations, including capital and operating budgets. To this end, as a pre-condition to any equipment donation, we will require that potential partners complete a total-cost-of-ownership (TCO) analysis to ensure that they fully understand the long-term budgetary and operational implications and commitment that will be required of them.

Conclusion

Cisco CSR excels at focusing on important humanitarian goals with engagements that make innovative use of Cisco's technical solutions and expertise. Children's healthcare is a critical concern throughout the world, yet it has not received the attention and resources that it deserves. Cisco CSR can make a substantial global impact by leveraging Cisco technologies to improve children's health, with the potential to benefit a spectrum of communities now and in the future.