

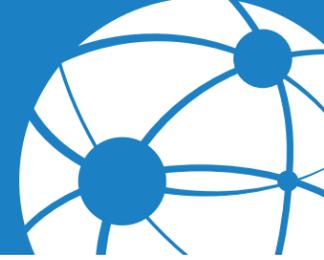


INNOVATIONS IN HEALTHCARE™

Healthcare Innovation in Latin America and the Caribbean: A Focus on Emerging Trends and Market Opportunities in Brazil, Colombia, and Mexico

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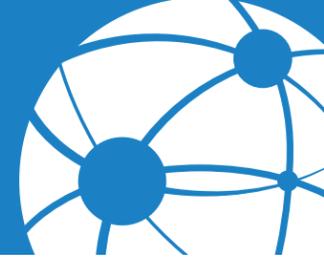
WORKING PAPER 16-01



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ACKNOWLEDGEMENTS
The authors thank the many expert interviewees who contributed their time and insights to this study. In particular, we thank Lucas Andrade, Ramon Castano, Erik Cavalcante, Fernando Cembranelli, Anna De La Cruz, Miguel Garza, Camilo Gonzalez, Irene Morilla, Santiago Ocejo, and Carlos Zago who reviewed and commented on sections of this paper. We also thank Sarah Gelfand, Claire Meriwether, and Sayari Patel who supported the project with their insights and background research. We are also grateful to the staff at the Center for Health Market Innovations within the Results for Development Institute, who provided access to and support for analysis of their database of healthcare innovations around the world.

2016 | Published by Innovations in Healthcare, Durham, NC (USA)



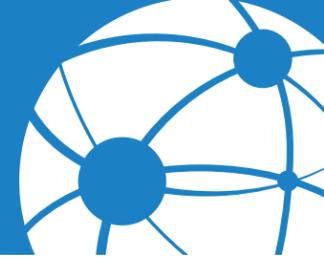
• **Across Latin America and the Caribbean (LAC), investors, health system leaders, accelerators, governments, and multinational corporations are looking to identify and evaluate novel approaches to affordable, quality healthcare. Since the launch of our network in 2011, Innovations in Healthcare has worked with many forward-thinking healthcare organizations in LAC, including MedicalHome, APROFE, and salauno. Our efforts have identified clusters of innovations emerging in Mexico, Brazil, and Central America. We noted the growing interest from multiple stakeholders, and, in response, decided to study and analyze those clusters to better understand trends in the region, along with specific ecosystem characteristics that promote or hinder the development and scale of healthcare innovation. The resulting landscape study we present here focuses on Brazil, Colombia, and Mexico.**

A number of distinct themes from each country will be explored in detail in the chapters that follow. **These themes emerged most broadly across our research, and have far reaching implications across all three study countries:**

- **Governments are key players.** Relative to other geographies such as India and Kenya, governments in LAC countries play a very large role in healthcare delivery and payment, especially for low- to middle-income populations. As a result, governments factor heavily in the ecosystem surrounding innovation activity, while also directly shaping the strategies of individual innovators and funders.
- **Regulations hamper labor flexibility and implementation of task-shifting models.** We found that outdated regulations and entrenched interests of professional groups in LAC countries hamper labor flexibility and implementation of task-shifting models. In effect, those factors limit opportunities to test the efficiency and effectiveness of task-shifting models, which are central to many cost-cutting innovations in countries around the world—and address healthcare workforce shortages while increasing efficiencies in care delivery.
- **Private sector innovators face a lack of appropriate growth funding.** Private sector innovators face a lack of appropriate growth funding; in fact, innovators in all three focus countries cited a lack of grant funding and flexible risk capital as a primary challenge to growth. The health sector is increasingly attracting investors because of the potential for high financial returns and clear social value. But the majority of investors are fairly new to the sector and cannot effectively evaluate healthcare entrepreneurs, do not fully understand the risks and rewards, nor can they provide technical assistance to help facilitate business growth.

- **Public-private partnerships in healthcare face challenges.** We did see that government partnerships can be beneficial to private sector players, enabling rapid large-scale expansion, as well as access to a large population of publicly insured patients. However, our analysis also revealed that private sector innovators have found partnering with the public sector to be difficult, often plagued with long waits for repayment, opaque tendering processes, and, at times, corruption.

These findings provide deep insight into the success of some innovative models and highlight the structural and market barriers that discourage other types of innovation. Over the last twenty years, the academic and policy communities have paid increased attention to the role of the private sector in health systems in low- and middle-income countries, including LAC countries. Today, to take better advantage of the nimble approaches and better-aligned incentives of the private sector—factors that drive productivity and customer satisfaction—governments are exploring public-private partnerships across the spectrum of healthcare provision. This study informs that exploration by highlighting the complementary functions of the public, private, and non-profit health actors in Latin America, assessing how these sectors both collaborate and work independently to foster innovation, and showcasing emerging business models for health improvement in Latin America.



• **Rapid changes to the healthcare landscape across Latin America and the Caribbean (subsequently referred to as LAC) follow the convergence of political, economic and demographic factors that have shaped the region’s distinct approach to healthcare system reforms. Beginning in the late 1950s, following the Cuban and Venezuelan revolutions, most Latin American countries were governed by military dictatorships, with the exception of Mexico and Costa Rica. ¹ After decades of military rule, economic crises in the 1970s and 1980s, deep cuts to government expenditures on publicly financed healthcare systems, and human rights abuses, democratic social movements blossomed in the 1990s and prominently positioned healthcare as a universal entitlement. ²**

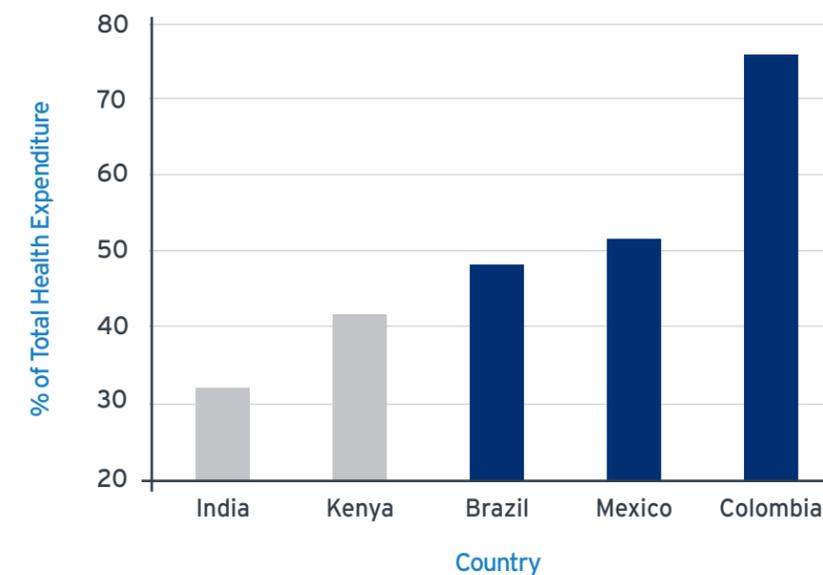
In parallel to political shifts, LAC countries are currently seeing rapidly increasing rates of chronic disease, in addition to persistent high mortality rates from infectious disease, traffic accidents, and maternal and child deaths. ⁴ As a result, health systems in LAC must transition from the provision of acute care to more comprehensive approaches for addressing complex, chronic conditions.

LAC countries have made impressive gains in alleviating poverty; however, the region remains plagued with wide income gaps. Relative to other regions, Latin American governments play a very large role in healthcare delivery and payment, especially for low- to middle-income populations (see Table 1). However, wide variation exists in the quality of public healthcare, as well as between the public and private health sectors, in many countries throughout the region.

“IN THE 1980S, HEALTH EMERGED AS A FUNDAMENTAL HUMAN RIGHT AND ENTITLEMENT IN LATIN AMERICA—REGARDLESS OF SOCIAL POSITION OR CAPACITY TO PAY—AND A DEMOCRATIC PLATFORM FOR RECLAIMING CITIZENS’ RIGHTS.”
 ATUN, RIFAT, ET AL. ³

Over the last decade, the proportion of public health expenditure as a percentage of GDP grew in each of our study countries (Brazil, Colombia, and Mexico). ⁵ Despite these high levels of public spending on healthcare, private spending still represents a significant portion of healthcare expenditures, just over half of total health spending (51.8%) in Brazil and nearly half of total spending in Mexico (48.3%) in 2013. ⁶ In our study countries, as in much of LAC, the majority of private expenditure is out-of-pocket (OOP) spending, with over 90 percent of private spending in Mexico coming from OOP expenditures. ⁷

Table 1: Public Health Expenditure



Source: The World Bank. 2013. World Development Indicators. *Health expenditure, public (% of total health expenditure)*. <http://data.worldbank.org/indicator/SH.XPD.PUBL>

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Across the region, there is a sharp divide within the public sector between well-funded public social security agencies serving salaried workers across sectors, and Ministries of Health services, often characterized as overburdened and under-resourced, primarily serving poorer populations. ⁸ Overall, public systems remain underfunded and significant disparities persist, both throughout the LAC region and within countries (e.g., urban versus rural areas), while private spending on healthcare service provision, fueled by the growing middle class, is rising. In this context, governments have yet to strike the optimal balance of fostering market-based growth while also ensuring the poorest citizens obtain access to quality services.



Study Objectives and Methodology

Since the launch of our network in 2011, Innovations in Healthcare has worked with many forward-thinking healthcare organizations in LAC. Our efforts have identified clusters of innovations emerging in Mexico, Brazil, and Central America. At the same time, we have observed growing interest from investors, health system leaders, accelerators, governments, multinational corporations, and other innovators to identify and evaluate healthcare innovations more broadly across the LAC region. In response, we decided to study and analyze those clusters to better understand trends in the region, along with specific ecosystem characteristics that promote or hinder the development and scale of healthcare innovation. This landscaping study was designed to identify trends in healthcare innovation in the region, with a specific focus on Brazil, Colombia, and Mexico. In addition to mapping market-driven innovative models and emerging trends, we also sought to identify specific ecosystem characteristics that promote or hinder the development and scale of healthcare innovation. See Table 2 for a profile of our study countries.

Innovations in Healthcare uses the term “healthcare innovation” to characterize inventive models of care delivery, financing, systems support, products/technology, or workforce training that create dramatic improvements in access, affordability, and/or quality, often advancing progress across all three dimensions. We aim to identify models that are sustainable, scalable (can grow within their original target market), and replicable (can be exported and adapted to additional markets). These types of healthcare innovations, while not exclusively, are most often found in the private sector, often target low-income or base of the pyramid (BOP) markets, and often have a social mission.

We began with a review of the literature to better understand the context of healthcare and innovation in the region. We followed this background research with an analysis of the Center for Health Market Innovations (CHMI) database, exploring trends and specific examples of healthcare innovation currently operating in LAC.

After the initial desk research period, the study team conducted first-round interviews with a number of LAC experts. These conversations were followed by field research visits and in-person interviews in Brazil, Colombia, and Mexico. Expert interviewees, from over 130 organizations and innovators across the region, represent a wide variety of stakeholders in the private sector, government, NGOs, investors, and academia within the region. A full list of the organizations is included at the end of each country chapter. The views and opinions expressed by interviewees do not necessarily reflect the official policy or position of any individual organization listed.

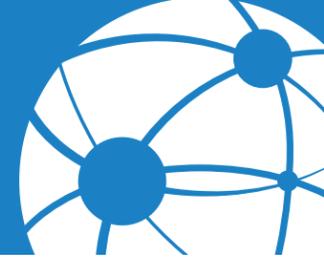
Our team analyzed initial findings from desk research and field interviews, and then conducted a final round of remote interviews as needed to address gaps and gather additional information. The team then shared an initial summary of research findings for feedback from select Innovations in Healthcare community members to further refine the analysis. Each chapter was also reviewed by an external panel of country experts.

Table 2: Characteristics of the Study Countries

	Brazil	Colombia	Mexico
A Population	200 million	48 million	122 million
A Urban population	85%	76%	79%
A GNI (Per capita, PPP)	\$14,750	\$11,890	\$16,110
A Leading causes of death	1. Ischemic heart disease 2. Stroke 3. Lower respiratory infections	1. Ischemic heart disease 2. Interpersonal violence 3. Stroke	1. Diabetes 2. Ischemic heart disease 3. Stroke
B Physicians (per 1K people)	1.9	1.5	2.1
B Nurses and midwives (per 1K people)	7.6	0.6	2.5
B Health expenditure, total (% of GDP)	9.7%	6.8%	6.2%
B Public health expenditure (% of total expenditure on health)	48.2%	76%	51.7%
B Out-of-pocket health expenditure (% of total expenditure on health)	29.9%	13.9%	44.1%

A Brazil: WHO statistical profile. World Health Organization, 2015. <http://www.who.int/gho/countries/bra.pdf?ua=1>
 Colombia: WHO statistical profile. World Health Organization, 2015. <http://www.who.int/gho/countries/col.pdf?ua=1>
 Mexico: WHO statistical profile. World Health Organization, 2015. <http://www.who.int/gho/countries/mex.pdf?ua=1>

B The World Bank. World Development Indicators. <http://data.worldbank.org/indicator/all>



Healthcare Innovation in LAC

In regions around the world, healthcare innovation is largely driven by rising costs, shifts in disease burden, and systemic challenges such as workforce shortages and lack of financing options. In the face of such barriers, entrepreneurs and established providers are developing nimble models of care delivery that respond to market gaps, enable new cost efficiencies, and aim to make healthcare more accessible and affordable. However, this plays out in very different ways around the world, due to differences in operating environments, culture, and financing that impact innovation and ease of market entry.

A recent report by the Organisation for Economic Co-operation and Development (OECD) Development Centre, “Start-up Latin America: Promoting Innovation in the Region,” noted that innovation growth is slower in Latin America than in OECD countries, which can be attributed to both the financing and regulatory environments. On average, Latin American countries invest a smaller percentage of GDP in research and development than do OECD countries (0.63% versus 2.4% in 2009).⁹ Latin American banks are less likely to finance start-ups, and venture capital is less developed in Latin America than in the United States.

Investment Gaps

A particular issue facing private sector entrepreneurs is a lack of financing at certain stages of development. Additionally, while business incubators and accelerators throughout Latin America offer support, they are generally affiliated with university and academic research centers rather than the wider business community. Looking at the focus countries for our landscaping study, venture capital investments in 2010 were 0.27% of GDP in Brazil, 0.16% in Colombia, and 0.02% in Mexico.¹⁰ With the least-developed venture capital market, Mexico is at the most disadvantage for early-stage innovation. Brazil is making greater strides in this area, with funding options for each stage of innovation and growth.

While distinct challenges related to the innovation ecosystem in the region exist, such as poor infrastructure and insufficiently trained workforce, the OECD report notes a bright spot: new support provided by the governments of Brazil, Colombia, and Mexico to reduce regulatory barriers to and costs of starting new businesses.¹¹ Governments in Latin America are increasingly recognizing the critical role that innovation plays in economic development and, in recent years, have adopted and strengthened policies and regulatory structures that can foster innovation.

Opportunities at the Bottom of the Pyramid

Despite persistent challenges, the ecosystem for innovation is burgeoning in the region, with healthcare innovation already experiencing significant growth. The 2015 Inter-American Development Bank (IDB) report, “A Rising \$750 Billion Market: Unlocking Opportunities at the Base of the Pyramid in Latin America and the Caribbean,” highlights the increase in purchasing power in the region’s base of the pyramid (BOP) market, and the role that this plays in creating an environment ripe for innovation.

The LAC BOP health market was \$31 billion USD in 2010 and, if it grows at the expected rate, the LAC healthcare market will lag behind only Eastern Europe and the Middle East in terms of speed of growth. While there has been a regional push towards universal healthcare, out-of-pocket spending remains high and there exists a great opportunity for innovation to improve access to health services and the quality of care. For instance, a willingness among the BOP to spend more in exchange for high-quality care creates the opportunity for financing mechanisms that facilitate this.¹² The IDB report highlights two organizations in the Innovations in Healthcare network (VisionSpring and Clínicas del Azúcar), working to improve access, quality, and affordability of healthcare for the BOP in Latin America.

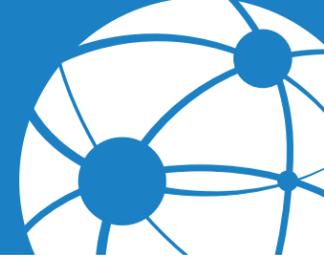
Types of Innovation Across the Region

Our analysis sample of LAC models of innovation in the CHMI database included 153 innovators working in LAC; of those, 35 operate in at least one country outside LAC; 18 operate in more than one country inside LAC; 14 operate in at least one country outside LAC and more than one country inside LAC. Brazil had the highest number of programs listed (34), followed by Peru (21), Mexico (20), Haiti (19), Ecuador (18), and Bolivia (15).¹³ The findings of our analysis of these models underscore the growth of healthcare innovation noted in the literature, with delivery and financing models filling an important space in the so-called “innovation gap.”

About one-third of the innovators we analyzed focus on healthcare financing (via contracting, cross-subsidization, government health insurance, health savings, micro/community health insurance, or vouchers). The leading sub-categories within financing care are cross-subsidization and micro/community health insurance. About half of the LAC innovators included in our CHMI analysis sample focus on changing behaviors (most commonly via a health services chain). Over half (approximately 60%) of the organizations focus on enhancing processes via information communication technology (most common), innovative operational processes, laboratory testing/diagnostics, mobile clinics, developing products/equipment, or providing supply chain enhancements.

The top five health focus areas across the sample are primary care; family planning and reproductive health; HIV/AIDS; maternal, newborn, and child health; and secondary/tertiary care. The majority of programs are serving the general population (63%), with approximately one-quarter targeting young adults (ages 13-24) and women, respectively. The geographies served are evenly distributed across urban and rural areas. The innovative organizations largely serve the bottom (80%), lower-middle (82%), and middle (76%) income quintiles, with about a quarter also serving higher-middle (26%) and high (22%) income populations.

Several themes emerged from our review of the literature, analysis of the CHMI database, and our own field research. The chapters that follow highlight emerging trends across the region and provide analysis of market gaps and opportunities in the focus countries: Mexico, Colombia, and Brazil. Our findings, described in this report, provide insight into why some innovative models flourish, while also highlighting structural and market barriers that discourage other types of innovation. The report also highlights successful innovations as case examples.



Citations

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² Ibid.

³ Ibid.

⁴ Ibid.

⁵ The World Bank. 2013. World Development Indicators. *Health expenditure, public (% of GDP)*. <http://data.worldbank.org/indicator/SH.XPD.PUBL.ZS>

⁶ The World Bank. 2013. World Development Indicators. *Health expenditure, public (% of total health expenditure)*. <http://data.worldbank.org/indicator/SH.XPD.PUBL>

⁷ The World Bank. 2013. World Development Indicators. *Out-of-pocket health expenditure (% of private expenditure on health)*. <http://data.worldbank.org/indicator/SH.XPD.OOPC.ZS>

⁸ Cotlear, Daniel, Octavio Gómez-Dantés, Felicia Knaul, Rifat Atun, Ivana CHC Barreto, Oscar Cetrángolo, Marcos Cueto et al. "Overcoming social segregation in health care in Latin America." *The Lancet* 385, no. 9974 (2015): 1248-1259.

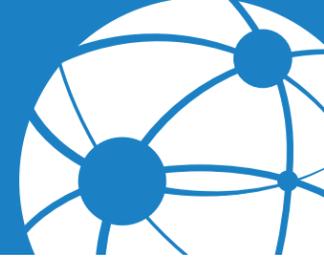
⁹ OECD. *Start-up Latin America: Promoting Innovation in the Region*. Development Centre Studies, OECD Publishing, 2013. doi:10.1787/9789264202306-en

¹⁰ Ibid.

¹¹ Ibid.

¹² Azevedo, Viviane, Alejandra Baigun, César P. Bouillon, Duncan Duke, and María Lourdes Gallardo Montoya. *A Rising US \$750 Billion Market: Unlocking Opportunities at the Base of the Pyramid in Latin America and the Caribbean*. Inter-American Development Bank, 2015. doi: <http://dx.doi.org/10.18235/0000031#sthash.8kZn7b57.dpuf>

¹³ Center for Health Market Innovations. *Health program database*. <http://healthmarketinnovations.org/programs>



List of Acronyms

BOSI	Boticas Similares
GDP	Gross domestic product
IMSS	Instituto Mexicano del Seguro Social (Mexican Social Security Institute)
INADEM	Instituto Nacional del Emprendedor (National Institute of Entrepreneurship)
ISSSTE	Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (Institute for Social Security and Services for State Workers)
IT	Information technology
MNC	Multinational corporation
MUSEIC	Mexican-US Entrepreneurship and Innovation Council
NCD	Non-communicable disease
PSM	Promotora Social Mexico
WHO	World Health Organization

BACKGROUND

Mexico has a growing urban middle class and is increasingly burdened by non-communicable diseases (NCDs) with one of the highest rates of diabetes globally. Mexico is the second-most populated country in Latin America behind Brazil with a population of over 125 million and is primarily urban: 79% of the population lives in urban areas.^{1,2} Mexico's rapid urbanization coupled with increased population dispersion of rural communities compounds challenges related to healthcare access for small isolated communities.³ Mexico also has a large indigenous population (approximately 10% of the total population), which is concentrated in the rural-poor areas in the central and southern regions of the country.⁴ In just one decade, from 2000 to 2010, Mexico's middle class grew by 17%, representing one of the fastest growing middle classes in Latin America.* Poverty, however, continues to persist across the country, largely in rural areas.⁵

Chronic conditions are on the rise in Mexico, and more than half of public healthcare funds are spent on non-communicable diseases, 20% on diabetes alone.⁶ The World Health Organization (WHO) estimates that NCDs are responsible for more than 75% of all deaths in Mexico, with cardiovascular diseases and diabetes leading the list.⁷ Lifestyle and demographic changes among the Mexican population have contributed to an increase in the prevalence of diabetes risk factors, and rates of diabetes among the younger generation are rising, leading to greater loss of potential life as well as increased economic burden.⁸

* Note: the World Bank defines the middle class in Latin America as those who make between \$10 and \$50 USD per person per day.

In the last two years alone, 6 million Mexicans have been diagnosed with diabetes, the second leading cause of premature mortality in Mexico, placing a huge burden on the healthcare system, including public hospitals; the main reasons for hospitalization among Mexican men and women are non-surgical treatment of diabetes, heart attack, and hypertension.^{9,10}

The Ministry of Health has warned that unless obesity rates decrease, public health costs could double by 2017. If current trends continue unabated, diabetes will cause increasing rates of morbidity, premature death, and economic burden for Mexicans.

Mexico has executed major insurance reforms in the last ten years that have expanded coverage to the majority of the population (see Box 1). However, interviewees noted issues in the public healthcare delivery system, such as long wait times (both to schedule an appointment, as well as during the visit), quality of care, and coverage gaps for specialty care drive users to seek care in the private sector, resulting in high out-of-pocket expenditures, particularly for medicines and secondary-level care. Issues around quality regulation plague both public and private healthcare delivery. These gaps in the current health system in Mexico offer an opportunity for private and public sector players to build solutions that bring more and better care to the segments of the population that need it most.

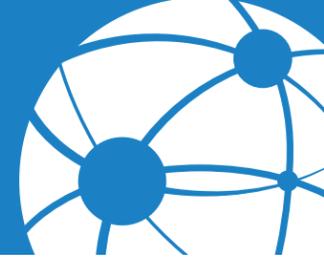
Box 1: Public Insurance Programs in Mexico

Mexicans with formal employment in the private sector are eligible for the Instituto Mexicano del Seguro Social (IMSS) healthcare program, which is funded by employees, private employers, and the federal government. Separate insurance programs exist for petroleum workers and the armed forces.

Public sector employees have access to the Instituto de Seguridad y Servicios Sociales de los Trabajadores del Estado (ISSSTE) healthcare program, which exclusively covers local, state, and federal government employees. Approximately 40% of the Mexican population receives coverage from either the IMSS or the ISSSTE.¹¹

Seguro Popular (Popular Insurance), a publicly-subsidized health insurance program, is available to everyone not covered by other insurance schemes. Seguro Popular was created as part of the 2003 reform to legislate access to healthcare for lower-income families previously excluded from traditional social security schemes. By 2013, Seguro Popular enrollment hit 55.6 million.¹² Fees are determined on a sliding scale based on income and about 20% of the poorest families pay nothing. Most enrollees are part of the four lowest income deciles. Just over a third live in rural areas and nearly 9% are from indigenous communities.¹³

Little overlap among providers exists between public and private sector provider networks. IMSS and ISSSTE, supported by government funding, each function as independent, integrated network and delivery systems, as is the case for other government plans, such as the sector-specific schemes noted above. Seguro Popular's provider population is about 98% exclusive to the insurance program, though the program integrates a few private providers, mostly for costly services like dialysis and oncology treatments.



Access to Care

The demand for care exceeds supply at all levels, from primary to specialty care, with exacerbated gaps in rural settings. There is a dearth of healthcare services in comparison to demand, and this is especially true for primary care services. The lack of human resources, infrastructure, and investment in primary care results in too few providers available to patients, particularly in the public sector. The private sector has attempted to fill this primary care gap with pharmacies, which often serve as the entry point into the health system and an alternate mechanism for seeking consultations, with fees incurred as out-of-pocket expenditures for customers.

While the public sector includes many of the country's highest-quality providers for specialty care, they are concentrated in centers of excellence and do not have the capacity to meet demand throughout the country. Although higher-level care options exist in both the private and public sectors, there are still a number of issues that hinder access, such as wait times upwards of eight months for an appointment. In other cases, such as highly specialized cancer treatment, care may not be available in-country, and public insurance will not cover the cost of receiving treatment elsewhere (e.g. in the US). Specialty care in the private sector is reserved for those with private insurance or those who can afford the out-of-pocket payments, which are prohibitive for the majority of the population.

In 2011, Mexico had a national average of 2.1 physicians per 1,000 people, below other Latin American countries such as Uruguay (3.7 in 2010) and Argentina (3.2 in 2010).^{14,15} Rural areas are even worse off. Rich states, like the Federal District that includes the capital Mexico City, have as many as six times as many specialists and three times as many hospital beds as a poor state like Chiapas.¹⁶ Mexico City has 4 doctors per 1,000 people (above the national average), while Chiapas in the southern part of the country has less than 1 per 1,000 people, well below the national average.¹⁷

However, this funding gap does create an opportunity for innovative financing mechanisms, as discussed below. Despite efforts to provide universal coverage, there are significant disparities in the availability of care between the cities and the rural areas in Mexico, and between states and municipalities. Expert interviewees noted that although universal coverage through Seguro Popular is a national effort, much of the funding and decision-making about care options is delegated to the state and municipal levels, which also causes variation in quality and access. The benefits packages available via Seguro Popular in the largest cities (located in the wealthy northern states) are much larger than those available to the poor in the rural south.

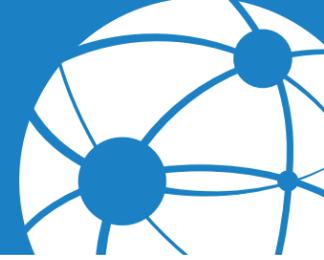
Mexico struggles with an underutilized general practitioner population, an issue that was reiterated by many key informant interviews in this study. Expert interviewees noted that residency placements for physicians are very limited and extremely competitive. As a result, many doctors-in-training do not have the opportunity to specialize, leading to a surplus of general practitioners. In 2000, 28% of doctors were unemployed, working in sectors outside of health, or working less than full time.¹⁸ A 2008 National Occupation and Employment Survey also showed that 81 per 1,000 physicians were underemployed and 132 per 1,000 were unemployed. The rates are even greater for nurses (112 per 1,000 underemployed; 237 per 1,000 unemployed).¹⁹ Doctors often take jobs at pharmacy chains paying well below what would be expected for a newly practicing physician. There is a national opportunity to properly compensate and incentivize this workforce for increased care provision.

Cost

Government spending on healthcare in Mexico is low compared to other countries in Latin America and, despite recent insurance reforms, out-of-pocket spending in Mexico is still the fourth-highest among the 17 Latin American countries classified as upper-middle-income by the World Bank. In 2013, Mexico spent 6.2% of its GDP on health.²⁰ Public spending accounted for 51.7% of the total health expenditure in Mexico in 2013, representing an increase in public health spending over the preceding decade, from 44.2% in 2003. Private sector spending accounts for the remaining 48.3% of healthcare expenditure.²¹ Despite reforms and increased public investment in health, Mexico's per capita spending still remains below the average of Latin American countries.

In 2003, the Mexican Congress established the Sistema de Protección Social en Salud (System of Social Protection in Health) to increase public funding by 1% of the 2003 GDP over seven years to provide universal insurance coverage, helping to increase public expenditure as a percentage of total health expenditure as noted above. As a result of that increased funding, Seguro Popular was created. Seguro Popular, a public health insurance program designed to provide coverage to everyone not already covered by existing insurance programs, has reached more than 55 million people since its launch.²²

Seguro Popular provides coverage for a limited set of services, and individuals requiring specialty medications or consultations must pay out-of-pocket or go without.²³ This contributes to the large proportion of out-of-pocket costs in Mexico, 91.5% of all non-public spending on healthcare. The Mexican government has expanded and facilitated the production of generic drugs to combat high out-of-pocket expenditures, with generics growing from 44% of all medical drugs sold (by volume) in 2007 to 71% in 2011.²⁴



Quality

In the public sector, providers lack the resources and incentives to prioritize quality care.

Public healthcare providers are constrained by a lack of physical resources and human capacity. Additionally, incentives are structured such that improving efficiencies are often not rewarded and may in fact inhibit providers from moving up in the government ranks. Public sector institutions, generally over-burdened and under-resourced, have significantly higher wait times than the private sector, both to get an appointment and then to see the provider at the scheduled time: in 2006, wait times for IMSS enrollees with a scheduled appointment averaged around 92 minutes versus an average wait time of 29 minutes in the private sector. Users of public services also indicated an 18.2% cancellation rate of surgeries (half occurring after hospitalization) in 2004, mainly due to a lack of medical staff as well as surgery rooms.²⁵ Anecdotally, many interviewees also noted quality issues around chronic disease management, particularly diabetes control, which often requires coordinated, responsive, and ongoing care. Such coordination is often missing in the public sector due to a shortage of resources, as well as the absence of a comprehensive government strategy for addressing complex, chronic conditions.

In the private sector, reimbursement structures can incentivize providers to over-treat and overprescribe, resulting in care that may not be aligned with the patient's interests.

For example, increased use and overuse of caesarean sections have been documented in Mexico's private sector, likely supported by payment structures that create incentives for physicians to perform caesarean sections even when not medically necessary.²⁶ Government capacity is still so low relative to demand that private pharmacies provide most primary care consultations nationwide. However, pharmacies in Mexico have a documented history of operating without much oversight and providing substandard medical advice and unsafe medication. Interviewees noted analysis of the 2012 National Health and Nutrition Survey, which indicated a higher number of prescriptions being made in cases where the doctor was located adjacent to the pharmacy versus off-site. This has led to a push from the public health community for pharmacies to operate independently from on-site physicians in order to avoid over-prescription of drugs.²⁷

There are new programs working to counter this issue. For example, Boticas Similares (BOSI) is a pilot micro-pharmacy franchise program that aims to improve access to medicine for low-income, rural communities in Mexico.²⁸ Start-up loans are awarded to community members to establish pharmacies that sell high-quality generic medicines. Pharmacy owners are supported by the Linked Foundation's program partners with training in medicine and business, as well as with monthly check-ins. The model is designed to be profitable by leveraging a 30% discount for network pharmacies on medications purchased from Farmacias Similares, which are then sold at the original retail price.

INSIGHTS INTO THE INNOVATION CONTEXT

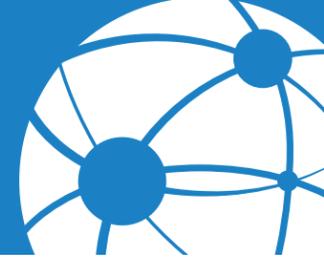
Our research in Mexico found that the majority of healthcare innovations are from the private sector and can be classified into several categories: *integrators, aggregators, or hybrid organizations.*

Integrators are models that seek to partner with, be incorporated into, and/or be financed by the public sector. Successful integrators, including some labs, blood banks, and dialysis providers, have a clear path to financing for products and services, as well as a clear avenue for sourcing patients or customers, given that the public sector provides the majority of care in Mexico. We found few examples of integrator success, largely because integrators are challenged with articulating a value proposition to the public sector. This challenge is amplified because it is often unclear exactly what the government wants or requires from a private sector partner. Furthermore, it is difficult to determine the correct audience for the pitch and to identify the decision-makers. This is exacerbated by the context of government health entities operating in silos, with multiple decision-makers for different parts of the care continuum, motivated by different incentives.

Aggregators are models that operate outside of the public sector, aggregating their own systems of care delivery or services and networks of patients/customers. It is easier for aggregators to define and grow their value proposition: they are directly accountable to patients, with the freedom to pivot based on patient needs. Aggregators face the challenge of securing sufficient financing outside of government payers. They are also tasked with self-sourcing customers, which can require a strategy for diverting patients away from free or low-cost government services.

One example of this is Clínicas del Azúcar, which operates a network of diabetes care providers known for providing quality and comprehensive diabetes care. The subscription-based payment model makes care more affordable, while the delivery model tailored to individual needs keep patients coming back.

Another example is MedicalHome, a telemedicine model connecting patients throughout Mexico by phone with doctors in a Mexico City call center. Using standardized protocols, these doctors are able to resolve more than 60% of issues over the phone and avert unnecessary clinic and emergency department visits. MedicalHome is a subscription model, and users also receive access to a national network of clinics, labs, and hospitals at substantial discounts. The MedicalHome model provides a convenient, affordable option to access high-quality healthcare without the burden of scheduling, transportation, or wait times.



Hybrid models are those that seek to both partner with the government and serve private patients. In theory, they get the best of both worlds: government financing and patient sourcing, while also being nimble in response to customer demands. In practice, this strategy is often hard to execute because of competing priorities. It can be difficult to keep costs low enough to match government reimbursement rates and keep quality high enough for the private market.

There is also a challenge of patient perception: private patients may be reluctant to use the same care delivery location and/or products that are also being offered to public patients. Our research found that this is more difficult to navigate in LAC countries than other regions, such as India. The stigma attached to public healthcare for low-income patients in Mexico, for example, can prevent private patients from going to the same clinic that also serves Seguro Popular patients, even if the quality and patient experience are highly rated.

An organization that has iterated their model to address this challenge is salauno, an eye care provider based in Mexico City. The original model for salauno was based on an adaptation of two eye care models from India, Aravind Eye Hospitals and LV Prasad Eye Institute, which serve both poor and rich at the same facilities. In these Indian models, wealthy patients pay full fees for services and can also opt to pay additional amounts for non-clinical amenities, such as private recovery rooms, all of which goes to subsidize free or reduced-cost care for poor patients. However, when salauno adapted this model to the Mexican market, they discovered that middle-income patients did not want to receive services from the same provider as poor patients.

The salauno model has now pivoted to reflect this market reality: they have created different service schedules (days and shifts) for paying and subsidized patients to avoid overlap of paying and non-paying patients and families. In the near future, they plan to build a surgical hub that physically separates both types of patients but offers the same infrastructure and high quality of personnel to both segments. The underlying efficiencies of the model that drive cost savings and quality outcomes will be the same across both facilities.



Supportive Ecosystem Factors

Our research identified factors that may increase opportunities for private sector innovators to partner with the government. Many innovators in Mexico see partnering with and/or being financed by the public sector as key to realizing scale, and we found interesting examples of new strategies to identify and incorporate new models of care from the private sector. Models that can demonstrate cost savings and efficiencies for the public sector, particularly in chronic care, may be most likely to gain traction.

Examples of high-level government support for integrating private sector innovative models of care into public sector delivery exist. Several organizations we spoke with as part of this study shared select examples of government support to integrate private sector innovations into public sector offerings. Examples include: the Presidential Innovation Fellowship that invited entrepreneurs to collaborate with IMSS to create private-style innovations within the public sector;²⁹ the creation of the Instituto Nacional del Emprendedor (National Institute of Entrepreneurship) (see Box 2); and the government's recent work with third-party partners to create a framework for private sector innovator engagement and to develop pay-for-performance mechanisms, both designed to improve partnerships with outsourced diabetes providers.

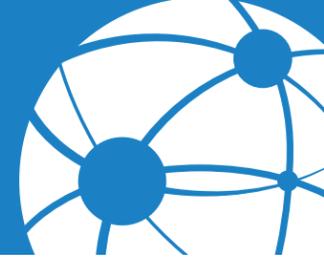
Box 2: Instituto Nacional del Emprendedor (INADEM)

INADEM, the National Institute of Entrepreneurship, is an office under Mexico's Secretary of Economy that offers resources and support to small- and medium-size businesses. Accepted entrepreneurs gain membership to a network that provides access to public and private sector partners, some of whom may provide preferential schemes such as discounts and exclusive offers. The institute offers a range of grants, including:

- Traditional and high impact business incubators (up to \$593,000 USD)
- Transition incubators (up to \$593,000 USD)
- Entrepreneurs under non-traditional incubation schemes (up to \$593,000 USD)
- Entrepreneurs under traditional schemes (up to \$370,000 USD)
- Micro, small and medium enterprises (up to \$370,000 USD)

Support provided by grantees can encompass a wide variety of activities, from training and consulting for creating high-impact companies to specialized professional services.

INADEM has also partnered with the US State Department to launch MUSEIC (Mexican-US Entrepreneurship and Innovation Council) to foster entrepreneurship and innovation in Mexico. The goals of the organization include integration infrastructure to support entrepreneurship, developing regional innovation clusters and marketing chains, sharing best practices on financing, and promoting high-impact entrepreneurship.



There are promising outcomes from these types of initiatives and collaborations. The first Presidential Innovation Fellowship funded and supported the research and development of an mHealth technology platform for IMSS. IMSS covers paid maternity leave, but requires women to have a certain number of prenatal appointments at IMSS clinics. Currently some women seek prenatal care from IMSS providers (as required to access IMSS maternity benefits), and then again with private providers (due to the perception that prenatal care is superior in the private sector), essentially resulting in duplicative care. The mobile app will allow women who choose to receive prenatal care from private providers to virtually notify the government that they received the required prenatal care without seeing an IMSS provider, therefore lessening the strain on the public system and reducing unnecessary costs incurred by over-provision of care. The app also provides patients with health tips and appointment reminders.

Regional innovation hubs, such as in the state of Jalisco, show promise for the private sector to spur innovation, supported by government interest in potential public sector gains. Guadalajara, Jalisco's capital city, is Mexico's technology capital and a hot bed for certain types of healthcare innovation, including medical device and technology innovations. Although the target market for most of these companies is outside of Mexico, there is potential for Mexico to use this largely untapped homegrown capability.

It is also worth noting that recent public sector-led efforts in Jalisco to spur innovation are taking a different approach from previous efforts, which attempted to organize broad collaborations between the public and private sectors with the goal of generating more grassroots collaboration between individual actors. Recent efforts have instead been organized around specific projects and health needs using a top-down approach with priorities set by Jalisco's newly-formed Ministry of Innovation Science and Technology. Although these efforts are still early, the Ministry credits this approach for gaining initial traction and buy-in from a variety of public and private stakeholders, including academic partners, which may serve as a useful model for other regions interested in creating more fruitful linkages between the public and private sectors.

There is a strong and growing supportive ecosystem for innovators in Mexico. Organizations like New Ventures, Angel Ventures, and Startup Mexico provide valuable support and networking opportunities for entrepreneurs and serve as pipeline partners for investors interested in funding innovations. These supportive ecosystem players, including accelerators, start-up funds, and other capacity building organizations, work across sectors and are typically not specific to healthcare. This is changing as a significant number of entrepreneurs are working in healthcare or health-related areas, driving an increase in focus on healthcare among supportive organizations.

Challenges in the Ecosystem

Our research also identified several challenges facing healthcare innovation in the Mexican context. Like the beneficial factors described above, many of these challenges relate to public-private sector engagement, given the strong presence of public sector funding for healthcare in Mexico.

Existing systems and incentives hinder the ability of new models to realize greater uptake.

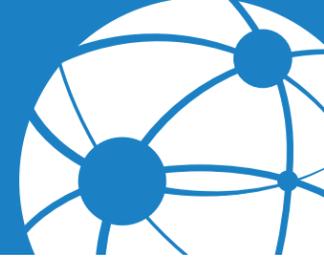
Many innovators we interviewed noted the challenge of navigating the siloed and fragmented government health entities and numerous decision-makers. Often private providers are viewed as too small relative to the much larger public sector, even if they have proven results. Additionally, the rules for participating in Seguro Popular and IMSS tendering processes can be arduous and time-consuming. While the largest companies may have an entire department dedicated to public sector sales, small entrepreneurs often lack the resources and knowledge about the public healthcare system needed to effectively engage government. In other cases, procedural adjustments, such as a change in reimbursement administration from the federal to the state level cause difficulties for innovators. The lack of a coherent public sector strategy about how to engage the private sector and the lack of clear avenues to facilitate this engagement, together with prohibitive regulatory structures, make partnership with the government a challenge for many of the innovators with whom we spoke.

Specific barriers include:

- **Lack of political will:** The government is currently exploring the possibility of partnering with private sector delivery providers to pilot innovative models of care that prevent and manage diabetes in a more cost-effective manner. This would result in outsourcing services from the public sector to the private sector.

However, interviewees noted that policymakers are hesitant to take away patients and service provision from public sector providers, despite the fact that the public sector delivery system does not have the capacity to meet demand. Doing so would likely upset the labor unions and cause further gridlock and lack of cooperation in the public healthcare system. Previous cases of successful partnerships primarily involve outsourcing of machines, technical equipment, and staff, avoiding challenges from physician unions.

Interviewees also noted that even without labor disputes, it can be risky for political leaders to push partnerships with the private sector. Stakes are high for government representatives tasked with procuring private sector healthcare innovations through an open bidding process. To fund a winning bid, initial data demonstrating success is required, but there is hesitancy to fund pilot projects because an unsuccessful pilot could threaten job security.



- **Misaligned incentives:** In addition to having little incentive to share patients with the private sector, public sector providers are also poorly incentivized to implement innovations for efficiency gains, as they are paid based on how long they have worked for the public healthcare system, not how well or efficiently they deliver services. Motivations and incentives also fluctuate with political terms. Impending leadership changes decrease motivation to implement changes likely to be reversed following the next election.

In the past, the public sector has successfully partnered with the private sector to outsource hemodialysis, blood banks, and some lab services; in these cases, the government executed a coordinated regional strategy that mapped specific pain points in each target region with the available private sector models in that same region. Bidding and contracts were then offered to the companies that were the best fit for the particular health needs of a region. These examples are instructive for their successes: healthcare entrepreneurs were connected, and the government played an active, facilitating role in designating target geographies and populations in the cases of multiple bidders. The private providers had clear reimbursement mechanisms within the public delivery system and incentives to deliver quality services to public sector customers. These stand as successful examples of outsourcing health services, and continue to operate in a permanent and sustainable way.

Private sector innovators also face a lack of growth capital: most financing options are sector agnostic and lack health-specific expertise. Many innovators cited a lack of grant funding and flexible capital as a primary challenge to growth. In particular, there is very little capital available for ventures in the growth period between years one and four. Health is a sector of increasing interest for many investors in the Mexican market because of its potentially high financial returns and clear social value.

Examples of investors working in this area include:

- **Venture Institute/Venture Partners:** Venture Institute is a support organization with a structured accelerator program paired with an impact investment fund (Venture Partners). This pairing of support services (accelerator model) with investment in the health sector is quite innovative in Mexico. These sister organizations are beginning to explore the health field.
- **Promotora Social Mexico (PSM):** PSM is a social impact financing organization that finances organizations through equity, debt, and grants. PSM has financed several organizations in the Innovations in Healthcare network and is one of only two investment firms from Mexico that are members of the Global Impact Investing Network (GIIN). PSM finances organizations in education, health, and economic development and micro-finance.
- **Fondo de Inversion Social Nacional:** This impact investing fund is part of the oldest and most well-known charity in Mexico, Nacional Monte de Piedad. The fund itself is relatively new and was founded in order to increase sustainability of the philanthropic activities of the charity. The fund is sector agnostic, although health, education, and financial inclusion have been common sectors for investment.

For the majority of investors, however, health is a relatively recent area of focus and most do not have deep expertise to effectively evaluate healthcare entrepreneurs, creating an uncertainty about how to enter the market and contributing to a lack of risk capital for healthcare entrepreneurs.

MARKET GAPS AND OPPORTUNITIES

Despite challenges, public-private partnerships represent an opportunity, particularly for innovative models addressing chronic disease management, as well as for models that span the healthcare value chain. Evolving corporate strategies for global health innovation show promise, while gaps in healthcare funding create opportunities for innovative financing mechanisms, especially for models that can diversify revenue streams beyond public sector reimbursements.

The private sector is well positioned to design and test cost-effective models for addressing chronic conditions. Affordable, efficient models with the ability to reach the most vulnerable populations are essential for the future of Mexico's healthcare delivery system. As noted above, the government is exploring ways to coordinate public-private partnerships for managing chronic disease, including plans for an IMSS-sponsored diabetes care and management pilot.

The government has also engaged a third-party partner to help design and structure contracts between the public health system and private diabetes care providers, develop impact metrics to measure fiscal and social impact of these contracts, and act as an external evaluator for each pilot. Potential projects, such as a pay-for-performance diabetes prevention program, are structured in two time-bound phases: the contract and evaluation plan design phase (2 years), and project management (5 to 6 years). Increased transparency of the tendering process, as well as controls to ensure that the best provider would win the contract based on performance rather than connections, make this a particularly promising avenue for innovators.



Innovations that span the value chain, addressing multiple health challenges in one solution, show promise but also face challenges in scaling up. Many of the innovators we observed were addressing more than one pain point in the health system, designing offerings that bundled financing, care, and technology. By structuring solutions in this way, innovators such as Salud Cercana simultaneously improve the functioning of multiple aspects of the healthcare delivery system. Other examples of this include Imagen Dental and Biodent (bundling care and informal financing mechanisms for patients), and Clínicas del Azúcar (innovative payment model and services). By ensuring the care delivery methodology has a revenue stream (solving for health financing) and that funding stream is being used in the most efficient way (often through leveraging technology), companies are able to operate successfully at small scale.

However, scaling up bundled systems inherently has its own challenges, most notably stakeholder management. With multiple stakeholders for different components of the model (payment, service delivery, patient sourcing, etc.), it can be difficult to align everyone to scale the entire model. An example that has scaled successfully is MedicallHome, also mentioned above. This model combines telemedicine (24/7 access to doctors by phone), in-person provider network discounts, emergency triage, and an innovative payment scheme. MedicallHome has grown rapidly and now covers the entire country of Mexico. The model has recently launched in the Philippines and been adapted to the United States.

innovator spotlight

Salud Cercana

Salud Cercana is Mexico's first pre-paid primary care plan that uses a mobile health app to integrate care throughout the delivery spectrum, with a focus of care coordination. This allows low- and middle-income populations to pre-pay a monthly fee of \$15 to \$17 USD to receive \$60 of primary care per month. Salud Cercana seeks to assemble sustainable patient bases for underutilized primary care doctors; once there are 200 to 300 patients signed up in a concentrated area, a general practitioner opens up a practice for these patients, as well as walk-in clients. A sales force of health coordinators enroll patients, who receive primary care consultations in locations near their homes and become part of a mobile wellness community. Salud Cercana provides standardized primary care, with an initial focus on patients with cardiovascular diseases and moving to full primary care. Micro-insurance for cardiac emergencies is included as part of the coverage plan.

There are opportunities for corporate partners to assume more holistic approaches to global health challenges. Our research found examples of multinational corporations (MNCs) moving toward more comprehensive approaches, away from a singular focus on specific drugs or devices. Many MNCs are creating special units within the organization that are better positioned than traditional core business units to collaborate with in-country entities (governments, NGOs, etc.) in innovative ways. In some instances, these units also help drive research and development for low-resource settings by identifying potential global health technologies, brokering relationships between key actors (such as WHO), and providing the company's manufacturing and distribution expertise. Engaging actors like WHO to fund clinical trials reduces the risk of the investment for MNCs, an important factor given profit-driven stakeholders.

There is a market gap in healthcare financing, creating an opportunity to design and deliver alternative models to fund healthcare. Financing options for healthcare in Mexico are currently limited to the public sector and private insurance companies (high premiums and low coverage at 5%). The high percentage of out-of-pocket spending (nearly half of all healthcare spending), coupled with the high public insurance coverage, indicate an appetite for healthcare financing options that both facilitate more efficient public spending and ease the burden of out-of-pocket spending. Salud Facil, a financing company that facilitates government reimbursements, is one such example.

Salud Facil provides money to providers and is then reimbursed by public insurance programs, reducing hassle and wait time for providers to be paid. Salud Facil finances procedures including caesarean sections, eye surgery, and dental work, with an average loan size of \$2,000 USD, and conducts follow-up interviews with patients post-surgery.

Another example is Biodent, a dental care provider focused on reducing the high rate of out-of-pocket spending. In order to deliver high-quality care to low-income underserved populations, Biodent provides loans on favorable terms so that their patients can pay for the cost of treatments over time. This is unique in the Mexican healthcare context.



EMERGING HEALTHCARE INNOVATIONS IN MEXICO

Many innovative healthcare models are emerging in Mexico, largely in response to the market gaps noted in the previous section. In our landscaping research, we discovered a wide range of innovative activity in the healthcare sector in Mexico, primarily in the private sector. These innovations were not all focused on high-income populations: many emerging models of care are designed to improve the reach and efficiency of care to Mexico's low-income populations.

Most activity is in urban or semi-urban settings, however, and we found few innovative models serving rural areas. This may be due to the challenges that rural delivery models face in reaching financial sustainability, with low patient volumes and large coverage areas. Models that achieve financial stability in urban areas may eventually be able to leverage the profitability and capabilities of the urban model, and adjust it to expand into rural settings.

We identified three primary themes among innovative models reaching the low-income population in Mexico: chronic disease, healthcare financing, and technology-enabled services. For a list of the key organizations in Mexico studied for this report, see page 33.



Chronic Disease

Given the large and growing chronic disease burden in Mexico, it is not surprising that many of the innovations we identified in this landscaping study were focused on chronic disease prevention, diagnosis, and management. Many of these models specialize in a single disease (such as diabetes) to better manage costs and increase the likelihood of becoming an outsourcing partner for the government. Many of these organizations are also supplementing the traditional role of primary care in the context of high chronic disease burden and unmet need for prevention activities.

innovator spotlight

Clínicas del Azúcar

Clínicas del Azúcar, based in Monterrey, provides patient-focused diabetes management targeting low- and middle-income populations. Clínicas del Azúcar's one-stop shop clinics offer a comprehensive set of services on site, including clinical consultations and assessments, lab testing, and access to medicine, so that patients do not need to travel to multiple places to manage their diabetes. Clinics are strategically located to minimize transportation burdens and to encourage walk-ins.

The model uses a proprietary technology platform to collect and monitor all patient information. Use of algorithms that measure and respond to a patient's readiness to change at each visit drive both efficiencies in the care model and patient engagement, resulting in interventions tailored to each patient. Each clinic is staffed with medical professionals specializing in diabetes care, including physicians, nutritionists, physiologists, nurses, laboratory technicians, and pharmacy specialists.

Each patient pays a fixed annual membership fee that includes access to diagnostics, labs, and consultations for a full year. These membership fees make care available to more people by allowing patients to plan for the cost of care and for the clinic to spread costs across members. The integrated services model reduces costs to patients by dramatically reducing the number of trips patients need to make. Clínicas del Azúcar estimates that the model saves patients an average of 15 trips to the clinic each year and reduces the chance of developing a complication by 50% through early detection of complications and referral to a specialist.



Healthcare Financing

In our research, we identified many new and innovative private sector financing schemes designed to complement existing public health insurance offerings. Many of these address the burden of out-of-pocket spending for higher-level care services. These healthcare financing organizations include a range of financing models, from low-cost insurance to facilitating government reimbursements.



innovator spotlight

Alivio Capital

Alivio Capital is a for-profit organization that was founded in 2009 out of the need to provide financing for Imagen Dental's customers. Alivio Capital provides low-income families with access to loans for hospital bills, doctor fees, and essential medical equipment. They operate 24 hours a day and approve loans within one hour to aid in emergency situations. They work exclusively with private providers and offer two types of loans: one for Imagen Dental (approximately \$580 USD) with an 11-month payback period, and one for hospitals outside Imagen Dental (approximately \$1,400 USD) with a 16- or 17-month payback period. The maximum loan is \$29,500 USD. To assure the loan is for medical purposes, Alivio pays the service provider directly. There is a 28% annual interest rate. Alivio Capital gives close to 900 loans per month, and to date has given more than 33,000 loans.

Pro Mujer

Pro Mujer is a non-profit organization founded in 1990 that offers a range of services, including primary healthcare, health education, and financing, to low-income women in Argentina, Bolivia, Mexico, Nicaragua, and Peru. With respect to financial services, Pro Mujer provides loans to women (initial loans tend to be \$100 USD) and helps them craft business plans. Pro Mujer provides loans regardless of collateral or guarantor; instead, they rely on trust and peer groups called "communal banks." The approximately 15 women in each communal bank elect leaders, and meet every two weeks for capacity-building activities and loan repayment. The communal bank steps in to pay the balance if a member cannot make her payment. The Pro Mujer model has been successful; they house 26,570 communal banks and have a 97% average repayment rate.

Technology-Enabled Services

A number of healthcare innovators in Mexico are using technology to increase reach to patients in a more efficient manner via telemedicine and enhance access to provider information.



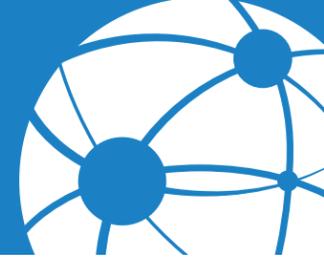
innovator spotlight

Previta

Previta is working to improve management of chronic diseases such as cardiac disease, hypertension, obesity, and diabetes, by using technology to facilitate remote monitoring of chronic disease patients through telehealth. They provide physical care through affordable retail clinics located within Walmart stores and mobile medical units. Previta created a population health management platform called E-healthtracker® that remotely monitors chronic disease patients and provides remote advice and guidance from health coaches. PreVita currently operates 86 retail clinics, all of which use Previta's E-healthtracker®, and provides more than 30,000 general consultations per month. Previta is expanding its business, providing services to the government and other public institutions.

Voy al Doc

Voy al Doc is a service that matches patients to physicians, and then helps to schedule appointments. Patients can browse doctor profiles online and schedule an appointment with the provider they select; alternatively, they can phone the Voy al Doc call center, describe their ideal physician, and be matched up with a provider. Patients review physicians and rate their experience after appointments. There is no charge to patients to use Voy al Doc and it gives them access to below-market rates for care. Voy al Doc benefits physicians by increasing the number of patients they see and increasing their online presence. Doctors are given a free trial, after which they are required to pay if they wish to retain a profile. Voy al Doc currently facilitates 500 appointments per month, and features 6,000 doctors (220 of which have completed the free trial and are now paying for the service).



Interviewee Organizations - Mexico

The list below includes the organizations of our expert interviewees who contributed their time and insights to this study. The views and opinions expressed by interviewees do not necessarily reflect the official policy or position of any individual organization listed.

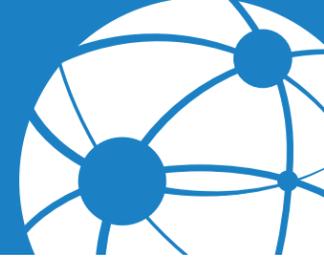
Organization

ADOBE CAPITAL
 AGORA PARTNERSHIPS
 ALIANZA MÉDICA PARA LA SALUD
 ALIVIO CAPITAL & IMAGEN DENTAL
 ASPIRE FOOD GROUP
 CLÍNICAS CUÍDATE
 CONNOVO
 ENTERPRISE MANAGEMENT SERVICE
 FARMACIAS SIMILARES
 FONDO DE IMPACTO SOCIAL NACIONAL MONTE DE PIEDAD
 IGNIA
 IMSS
 INNOVATION, SCIENCE AND TECHNOLOGY MINISTRY OF JALISCO
 INSTIGLIO
 MCKINSEY & CO.
 MÉDICA SANTA CARMEN
 MEDISIST AND VITAL ADVANCED
 NOVARTIS
 PREVITA
 PRO MUJER
 PROMOTORA SOCIAL MÉXICO (PSM)
 SALAUNO
 SALUD CERCANA
 SALUD FÁCIL
 UNREASONABLE INSTITUTE
 VENTURE INSTITUTE
 VENTURE PARTNERS
 VOY AL DOC

Principal Innovative Organizations - Mexico

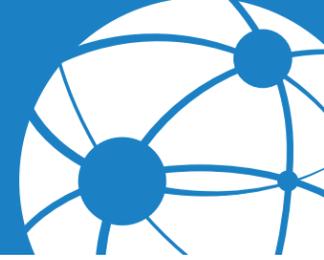
The list below includes the key innovative organizations in Mexico identified in this study.

Innovator (Year founded) TARGET SETTING LEGAL STATUS	Offering	Health need
ALIVIO CAPITAL '09 Rural, Urban, Peri-urban For-profit	Financing	Multiple health needs - any
BIODENT '10 Rural For-profit	Care Delivery, Financing	Dental care
BOTICAS SIMILARES '14 Rural For-profit	System support	Multiple health needs - any
CLICKMEDIX '10 Rural, Urban, Peri-urban For-profit	Product or technology	Non-communicable disease - Diabetes
CLÍNICAS CUÍDATE '12 Urban For-profit	Care Delivery	Non-communicable disease - Diabetes
CLÍNICAS DEL AZÚCAR '10 Rural, Urban, Peri-urban For-profit	Care Delivery	Non-communicable disease - Diabetes
COFAS '95 Rural, Peri-urban Non-profit	Care Delivery	Multiple health needs - limited scope
IMAGEN DENTAL '94 Urban For-profit	Care Delivery	Dental care
MÉDICA SANTA CARMEN '11 Rural, Urban, Peri-urban For-profit	Care Delivery	Non-communicable disease - Diabetes, Nephritis (kidney disease)
MEDICALLHOME '99 Rural, Urban, Peri-urban For-profit	Care Delivery	Multiple health needs - any
PACE '02 Rural, Urban, Peri-urban Hybrid	Health Workforce Training	Multiple health needs - limited scope
PREVITA '04 Urban, Peri-urban For-profit	Care Delivery, Product or technology	Non-communicable disease - Diabetes, Multiple health needs - any
PRO MUJER '90 Rural, Urban, Peri-urban Non-profit	Care Delivery, Financing	Multiple health needs - limited scope
SALAUNO '11 Rural, Urban, Peri-urban For-profit	Care Delivery	Non-communicable disease - Diabetes, Eye care
SALUD CERCANA '14 Rural, Urban, Peri-urban For-profit	Care Delivery, Product or Technology	Non-communicable disease - Diabetes, Cardiovascular diseases
SALUD FÁCIL '12 Rural, Urban, Peri-urban For-profit	Financing	Multiple health needs - any
VER DE VERDAD '11 Urban For-profit	Care Delivery	Eye care
VOY AL DOC '13 Urban For-profit	Product or technology	Multiple health needs - any



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List of Acronyms

ANDI	Asociación Nacional de Empresarios de Colombia (National Business Association of Colombia)
CR	Contributory Regime
EPS	Entidad Promotoras de Salud (Health Promoting Entity)
FOSYGA	Fondo de Solidaridad y Garantía (Solidarity and Guarantee Fund)
GDP	Gross domestic product
HMO	Health maintenance organization
IETS	Instituto de Evaluación Tecnológica en Salud (Health Technology Assessment Institute)
IPS	Instituciones Prestadoras de Salud (Health Providing Institutions)
JCI	Joint Commission International
NCD	Non-communicable disease
POS	Plan Obligatorio de Salud (Mandatory Health Plan)
PPP	Public-private partnership
SENA	Servicio Nacional de Aprendizaje (National Training Service)
SISBEN	Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales (System for Selecting Beneficiaries of Social Programs)
SR	Subsidized Regime

BACKGROUND

Colombia has a transitioning economy, increasing rates of non-communicable diseases (NCDs), and disparate geographic development. With a population of over 48 million people, 24% of the Colombian population lives in rural areas while the majority live in or near urban areas.^{1,2} This unequal population distribution has led to disparate rates of development, including in the healthcare sector, with rural areas showing the least improvement in the human development index over the last 14 years.³

Estimates indicate that 71% of all deaths in Colombia result from NCDs, with the largest contributions to this coming from cardiovascular diseases (28%), cancers (17%), chronic respiratory diseases (7%), and diabetes (3%).⁴ At the same time, Colombia faces an extremely unequal distribution of wealth, with half of the population receiving less than 15% of the total income in the country. The majority of the population lives below the poverty line and 17% of the population lives below the extreme poverty line.⁵ These geographic and wealth disparities propel disparities in access to quality healthcare between income levels and between rural and urban settings.

The vast majority of Colombians have insurance coverage as a result of government reforms from the early 1990s, which transformed Colombia's healthcare system. To alleviate healthcare disparities, the Colombian government ratified a landmark reform in 1993 (Law 100) to establish universal healthcare coverage, stipulating that all citizens are entitled to a comprehensive benefits package regardless of ability to pay.

The Colombian public health insurance system includes both an employment-based scheme (which we refer to as CR for contributory regime) and a subsidized scheme (which we refer to as SR for subsidized regime). The CR was designed to cover pensioners and individuals in the formal employment sector, while the SR was designed to cover poor informal workers and the indigent. Law 100 created a standard benefits package called the Plan Obligatorio de Salud (POS), or Mandatory Health Plan. Originally, the CR package was more comprehensive than the SR package, which only covered basic primary healthcare services and some high-cost catastrophic services. Since the passing of Law 100, several other recent reforms have been introduced to ensure greater parity between the SR and CR, including creating a standard benefits package for both regimes and ensuring geographic portability of benefits.⁶

Prior to 1993, only a quarter of the population was insured;⁹ by 2011, approximately 47.4% of Colombians were covered by the CR and 39.9% by the SR (see Table 1).¹⁰ There are also insurance plans that cover vinculados, that is, individuals not covered by another scheme, but who are eligible to receive services at public hospitals and clinics; additionally, there are regimes (regímenes de excepción) for special populations not insured by an EPS (see Box 1) and whose payroll deductions are sent directly to the government's general health fund, the Fondo de Solidaridad y Garantía (FOSYGA).

Box 1: Entidades Promotora de Salud (EPSs, or Health Promoting Entities)

EPSs are public or private, non-profit or for-profit, insurers charged with enrolling individuals into a plan and contracting with health service providers (known as Instituciones Prestadoras de Salud, or IPSs) to deliver care. Currently there are approximately 70 active EPS organizations in Colombia. The government's general health fund, financed through taxes and the contributory regime, delegates premiums to EPSs for their publicly-insured participants. A per capita payment is transferred to the EPSs to deliver the standard mandatory benefits package, creating competition for new enrollees in order to maximize revenue.^{7,8}

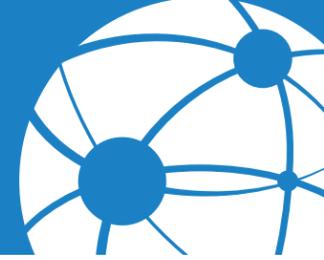


Table 1: Colombia's Health Insurance System

	Contributory Regime (CR)	Subsidized Regime (SR)
Eligible Population	Formally employed and informal/self-employed workers above a pre-determined income threshold	Low-income, vulnerable people are identified through the Sistema de Identificación de Potenciales Beneficiarios de Programas Sociales (SISBEN, or Selection System of Beneficiaries for Social Programs); only people identified by SISBEN are eligible for non-contributory coverage
Percentage of Total Population Enrolled, 2011	47.4% *	39.9% *
Financing	Financed by compulsory contributions from employers, employees, the self-employed, and pensioners with a 12.5% payroll tax. A solidarity fund known as FOSYGA (Fondo de Solidaridad y Garantía) was created to pool these contributions and provide cross-subsidies within the CR, as well as from the CR to the SR	Financed by taxes and transfers from the CR via FOSYGA, which funnels the 1.5% of monthly CR contributions

Table adapted from:
Giedion, Ursula, and Manuela Villar Uribe. "Colombia's Universal Health Insurance System." *Health Affairs* 28, no. 3 (2009): 853-863.

Content from:
Center for Health Market Innovations. "General Systems of Social Security in Health (Colombia)." Accessed August 2015. <http://healthmarketinnovations.org/program/general-system-social-security-health-colombia>
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As of 2013, almost 96% of Colombians had health coverage.¹¹ All care provided through the CR and SR, while publically funded, is coordinated through a mix of public and private insurance companies and delivery providers. The EPSs manage the administration of the benefits packages offered to patients and negotiate contracts with providers to deliver the services.

Public health expenditures represent the majority of healthcare spending in Colombia, increasing from about 55% of the total health expenditure in 1995 to 76% of the total in 2013.¹² Out-of-pocket health expenditure as a percentage of total health expenditure dropped from 38.1% in 1995 to 13.9% in 2013.¹³

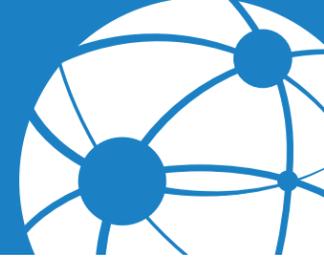
While public health expenditures represent the majority of healthcare spending in Colombia, total health expenditures as a percentage of Colombia's GDP have remained fairly constant between 5% and 7% of GDP from 2000 to 2013.¹⁴ The 1993 reforms vastly expanded insurance coverage and form the foundation of Colombia's current healthcare system.

Access to Care

The reforms of the 1990s have resulted in a vast expansion of coverage, but this expansion has not yet fully translated into increased access. Despite insurance coverage, many citizens still face significant access issues for a variety of reasons that are well covered in the literature, including long wait times for appointments; trouble accessing providers due to insurance authorization issues, leading to greater out-of-pocket costs; and increased informal care use, such as self-medication and using pharmacists as primary points of contact.

Specific challenges related to inadequate healthcare delivery capacity and increased demand for secondary and tertiary care services are driven, to some extent, by the recent expansion of the SR benefits to include coverage of secondary and tertiary care. In early 2015, a law known as Ley Estatutaria de Salud was passed to switch the benefits package from a positive to a negative list (listing what is not covered, rather than what is), resulting in another expansion of covered healthcare services.¹⁵

This expansion may not be matched by capacity. While we found that there is sufficient capacity for intensive care (though this care is clustered in urban areas), there is a significant shortage of general practitioners and family physicians, due in part to the high cost of medical training. The cost of residency, regardless of specialty, can be upwards of \$100,000 USD. Faced with steep debt, many doctors forego general practice or family practice because of the lower earning potential relative to specialties such as cardiology.



Healthcare workforce challenges are most acute in rural areas, where it is difficult for public hospitals and other providers to attract and retain doctors and nurses, especially amongst more specialized disciplines like anesthesiology. In rural areas, the capacity issues are also paired with higher transportation costs, further decreasing access to care. Overall growth in hospital beds is slower in these regions than in larger urban areas, where the private sector providers fill some of the capacity gap. In urban areas, most specialty care and tertiary care needs are served by the private sector, but smaller municipalities are still primarily served by the public sector.

As noted above, citizens covered under the SR previously had a limited benefits package compared with the CR. Historically, this provided primary care and high-cost catastrophic coverage, with a coverage gap for medium-complexity care; for example, maternity and sickness leaves were covered by the CR, but not the SR.¹⁶ However, since the SR benefits package was redesigned to match that of CR, there has been a surge in the number of individuals covered for additional services. The resulting increase in demand for secondary and tertiary care has not been met with a corresponding increase in supply.

Cost

Reforms have shifted health expenditures from out-of-pocket spending towards public spending.

As noted above, government expenditure as a percentage of the total health expenditure increased from about 55% in 1995 to 76.0% in 2013, whereas out-of-pocket health expenditure as a percentage of total health expenditure dropped from 38.1% to 13.9% in the same period. This decrease is largely due to increased insurance coverage; insured populations have a lower incidence of catastrophic expenditures than uninsured individuals (especially for inpatient care), reducing the total incidence of catastrophic expenditures in Colombia.

The incidence of catastrophic healthcare spending still increases as income decreases, and the most vulnerable income groups still have a higher probability of falling below the poverty line due to health expenditures.¹⁷ Despite the catastrophic healthcare spending challenges that remain for the uninsured and very poor, cost is not considered a barrier for the majority of Colombians in accessing healthcare. Because most services are covered in part or full by public insurance, cost challenges have largely moved from individuals to the government, while issues related to access and uneven quality remain relevant for end users.

Quality

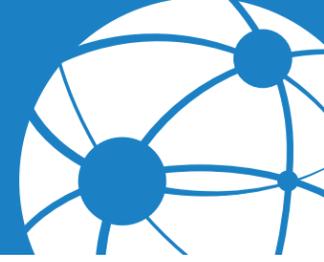
Quality of care remains uneven throughout the country, with both bright spots and large gaps.

Colombia is home to 20 of the 42 best hospitals in Latin America and most urban areas feature advanced facilities and well-trained providers.¹⁸ However, patients in Colombia generally have limited choice when it comes to providers. With most EPSs, patients can select a primary care provider within their designated network; secondary and tertiary care networks are arranged by the EPS, which is authorized to direct patients to a given provider, with little or no choice offered to the patient. If a patient is unhappy with the options within the EPS, change is possible, but with a relatively high cost to switch to a different provider network.

While previous reform efforts assumed that EPSs would play the role of “intelligent purchasers” of quality providers, this has not happened to the extent expected. In part, this is because of a lack of sufficient enforcing mechanisms to hold EPSs accountable for contracting with poorly performing providers. Also, a number of EPSs are vertically integrated and refer patients to IPSs within their own contracted network. Another plausible reason is a lack of mechanisms to assess institutional quality.

The accrediting body, operated by the Instituto Colombiano de Normas Técnicas y Certificación (Institute of Technical Standards and Certification), oversees compliance of national and international standards and operates on a voluntary basis.^{19,20} Additionally, while some international accreditation systems are relevant, such as Joint Commission International (JCI),²¹ these are also voluntary, and generally only the highest-performing private hospitals have sought their accreditation to date.

However, several recent efforts to drive higher quality show significant promise. For example, Cuenta de Alto Costo, a non-governmental technical agency, aims to address high healthcare costs and stabilize the healthcare system by creating risk management guidelines and workshops for EPSs and IPSs and by calculating estimates for high-cost treatments and specific conditions (i.e., chronic kidney disease, hypertension, and diabetes) Operating as an equalization mechanism for EPSs, the agency compares clinical outcomes as a way of determining the rate of reimbursement for each EPS based on the risk profile of their patient pool (previously there were few or no modifications on reimbursement based on the risk of the patient pool).²² Starting in 2015, the agency began to implement some pay-for-performance metrics, such as indicators for hypertension diagnosis rates and glycated hemoglobin control levels for diabetes patients.



INSIGHTS INTO THE INNOVATION CONTEXT

Our analysis of the innovation context in Colombia suggests that several ecosystem factors impact the types and potential success of emerging innovative models, including: public dissatisfaction with the health system, misaligned incentives to invest in innovation, barriers to labor flexibility, a growing role for universities in developing and supporting innovation, and an uncertain regulatory environment that increases risk for entrepreneurs and funders.

There is a general lack of public trust and overall frustration with the healthcare system, especially around EPSs. The negative perception of EPSs has been fueled by high-profile corruption cases and long wait times for care. In the past, EPSs have been sanctioned for fraud and mismanagement of funds, and the government has introduced reforms focused on finance and purchasing that attempt to address inefficiencies and the lack of EPS accountability that resulted from the 1993 reforms. The government is also implementing tighter regulation of medical device companies and the pharmaceutical industry, such as using price controls to promote generic drug use, and placing restrictions on direct advertising to physicians.²³ The shared discontent among those enrolled in both the CR and the SR has been compared to the public backlash against managed care (HMOs) in the US in the 1990s.

For CR enrollees, while there is some choice of EPSs in urban areas, the cost of switching can be high and the benefits of doing so are often unclear. For rural areas and for SR enrollees, in addition to high switching costs, there are fewer EPS options. Enrolling in an EPS is the only option for most people to access the health system. With the exception of higher-income populations who supplement CR coverage with additional private coverage, most citizens do not have a viable alternative for insurance coverage. Providers simultaneously experience advantages and disadvantages of the EPS

structure: while the EPS structure offers a defined provider network, crucial for guaranteeing patient volume, it also exerts a fair amount of administrative control because it approves provider payment. Contracting with an EPS is essentially the only option for providers to ensure sufficient patient volume; however, EPSs (payers) face slow repayment from the government, which administers the CR and SR; in turn, the EPSs are slow to reimburse providers for services rendered, with primary care centers bearing the largest financial struggles.

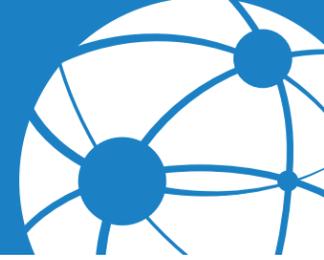
A great deal of variability exists among EPSs with regard to the importance of innovation.

Generally speaking, interviewees reported that external pressures do not incentivize EPSs to prioritize the introduction of new innovations into their practices. From a regulatory perspective, there is little emphasis on population health outcomes and from a business perspective, many EPSs report difficulty remaining afloat financially, keeping leadership focused on short-term challenges rather than the longer-term potential benefits of adopting new processes and models. However, a minority of EPSs are reportedly considering, and in some cases implementing, innovations with potential to create impact at the individual and population levels. We learned about work within Mutual Ser, an EPS primarily serving low-income rural populations, which has introduced new risk management models for chronic renal failure to better identify patients in stages 1 to 3 of kidney failure and enroll them into a program to prevent advancement to stage 4. We also learned about ongoing work with an EPS to consider over 20 potential healthcare delivery business models, ranging from comprehensive management for heart failure to non-acute care for mental health patients. The EPS is in the process of evaluating the models by financial needs, patient satisfaction and health outcomes, and potential for sustainability based on patient volume, and will select the most promising models to pilot test.

Public hospitals are less likely than private hospitals to engage in innovation activities; and within the private sector there is wide variation in degree of innovation. In urban areas, the delivery landscape is a mix of public and private sector hospitals, while rural areas are mostly served by the public sector. Overall, the private sector appears to have significantly more interest and activity in innovation as compared with the public sector.

Generally, public hospitals have little to no funding to invest in piloting or implementing new innovations. When introduced in public hospitals, an innovation is often driven by a specific doctor in an ad hoc manner, or by a manufacturer who helps run pilots with the ultimate goal of introducing and selling their products. Further, public hospitals are significantly more concerned with keeping costs low in the short-term and moving towards gaining external certification of their quality. Some outliers exist, such as the National Institute of Cancer Research, which is considering innovation and research in a more systematic way, but these efforts focus more on basic research than on innovation more broadly.

Within the private sector, there is a spectrum of appetite for innovation. Private hospitals linked to a university are much more likely to engage in innovation activities; however, these activities are generally research-focused with little to no commercialization or path to market.



Some recent developments have the potential to make the introduction of new innovations in both public and private hospitals more feasible and systematic. For example, the Instituto de Evaluación Tecnológica en Salud (IETS, or Health Technology Assessment Institute), a non-profit member organization that includes representation from Colombia's Ministry of Health and the National Health Institute. IETS, which issues clinical guidelines and provides guidance around a number of related issues for providers, is working to create a more structured process for evaluating new innovations across a number of measures (including cost-effectiveness) before making implementation recommendations.

Existing regulations hamper labor flexibility and ability to implement task-shifting models.

Task-shifting models ensure that each healthcare provider performs at the top of his or her scope of practice. The most highly-trained providers, such as surgeons, are used sparingly and only for those tasks they are uniquely qualified to perform. In many countries around the world task-shifting approaches have helped to cut costs, address workforce shortages, and increase efficiencies in care delivery. However, despite the recognized gap in human resources for health in Colombia, particularly in rural areas, current regulations limit the adoption of this approach. For example, interviewees noted that is illegal for any provider other than an obstetrician/gynecologist to conduct an ultrasound of a pregnant woman.

Other regulations stipulate that only an anesthesiologist can administer local anesthesia prior to stitching.²⁴ While many of these laws were originally intended to maintain clinical excellence, the current regulations are often maintained by entrenched special interest groups despite global evidence that other less-expensive providers can perform these same tasks with the same level of quality.

A few isolated examples of task-shifting models have emerged in Colombia; however, our research indicates an increasing appetite within some specialties to experiment with task shifting in the future. One successful task-shifting example identified in our research involves an urban rheumatology practice. In this model, a number of general practitioners deliver care directly to patients, while remaining under the overall supervision of the managing rheumatologist. The rheumatologist provides specialty training and overall

support for the general practitioners but only directly engages in high-complexity cases that go beyond the scope of their training. With this model, the rheumatologist is able to see four times as many patients as a traditional practice. Although this model violates regulatory norms, colleagues within the same special interest group of rheumatologists have yet to challenge it, likely due to a combination of enormous demand on the patient side (with wait lists of three to four months) and the fact that it is led by an "insider," a member of their own group.

A growing emphasis on innovation and entrepreneurship within universities is spurring the development of new technologies across sectors, including healthcare. However, many of these programs are still in early stages. A growing number of students and programs within Colombian universities are focused on innovation and entrepreneurship. Universities are offering innovation classes, and technology transfer offices and entrepreneurship clubs further support and foster student interest. However, health-focused innovation programs are typically anchored within engineering and biomedical programs, with only a few in business schools. These programs tend to be more focused on new technologies, rather than business model or process innovations for healthcare.

At a national level, Colombia does not have a history of established doctoral programs. A push in the late 1990s, led by Colciencias (Departamento Administrativo de Ciencia, Tecnología e Innovación, or Administrative Department of Science, Technology, and Innovation) helped to build PhD research capacity in universities, but the focus is on academic publications, rather than applied research.

However, a recent move to establish intellectual property and technological transfer policies at universities (such as at the Pontificia Universidad Javeriana in Bogota; the Universidad de Antioquia and Universidad EAFIT in Medellín; and the Universidad del Valle in Cali, Valle del Cauca) may support and incent the commercialization of new solutions.

Other examples of support for entrepreneurship can be seen in the hiring practices across sectors. The Asociación Nacional de Empresarios de Colombia (ANDI), a leading national business association in Colombia that works across many sectors, hired staff in early 2014 to focus exclusively on innovation programming and support. Large multinational companies such as GSK and Sanofi are increasingly emphasizing healthcare innovation as a part of their strategy, both by restructuring existing roles to include an innovation focus and creating innovation-specific hires within their Colombia offices. Within government, President Santos is prioritizing innovation, largely with a focus on implementing changes within the Ministry of Health, which came under additional pressure as the Millennium Development Goals neared their 2015 deadline.

For innovative companies, finding and retaining talent across a number of disciplines remains a challenge. In part, this is because there is a small talent pool relative to demand, as is true in many other parts of the world. Specific problems in Colombia include lower wages and higher risks inherent to a start-up environment, both of which are unattractive to many professionals such as engineers. Some companies have developed long-term approaches to this issue: Ubiquo Telemedicina, for example, started partnerships with universities to slowly cultivate new talent over time, rather than exclusively concentrating on existing talent in the marketplace.



Significant technical talent exists in university settings and technology transfer offices, but usually without the corresponding business acumen to push forward the commercialization of new technologies and innovation. Innovative companies also find it challenging to consistently attract and retain business professionals (including managers and marketing experts), as start-up endeavors typically come with a higher-risk profile than more traditional career pathways.

The uncertain healthcare regulatory environment hinders the activities of healthcare innovators and funders. Policymakers in Colombia continue to debate how best to address problems facing the current healthcare system, with a particular emphasis on EPS regulation. Potential legislative reforms currently in discussion may change the scope of services that the EPSs are required to cover, the way that individuals enroll in EPSs, and the mechanisms by which EPSs are assessed, among other factors. The extent to which these potential reforms will impact emerging innovations varies.

From a funding perspective, many funders see opportunities to address critical gaps in the existing system, but are delaying action until they see where these reform discussions land. Funders, including Fondo Inversor, LGT Venture Philanthropy, Acumen Fund, and MAS Equity Partners, shared this as a major concern for investing in healthcare, while public and private sector players indicate unease regarding short- and long-term strategy, particularly around potential payer-side changes.

The uncertainty about the future for EPSs has generally constrained elements of the healthcare innovation environment. The evolving nature and uncertainty around potential regulatory health system changes might be discouraging many actors from launching new approaches. For example, Ubiqo Telemedicina, a telemedicine company, was unable to implement distance telemedicine during its first eight years of operation because there was no mechanism for EPS reimbursement.

Instead, the company sold intrahospital technology platforms to private hospitals, allowing clinicians to collaborate on patient x-ray images, a viable business model while they waited for changes in the telemedicine regulations. It was only in 2014 that a regulatory change made it possible for Ubiqo Telemedicina to integrate into the EPS billing codes, and they have since begun their first distance telemedicine installations with public hospitals.

There is a lack of risk capital to support healthcare entrepreneurs; most financing options are sector agnostic and lack health-specific expertise. Entrepreneurs perceive a lack of patient and flexible financing options to support the development and scale of new models of care.

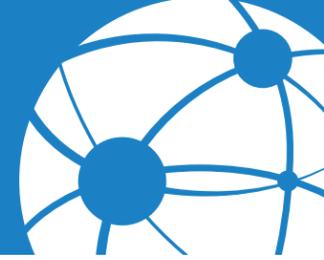
Typical funding options for Colombian health entrepreneurs include:

- **Banks**, which provide traditional loans;
- **Angel investors**, including a recently-launched business angel investor network in Colombia;
- **Impact investors**, both national (Fondo Inversor) and international (LGT Venture Philanthropy, Acumen);
- **Private equity firms**, such as MAS SEAF International Limited, which primarily invest in healthcare models targeting high-income populations;
- **Venture capital firms**, including three newly-launched firms, which are primarily focused on information and communication technologies and, to a lesser extent, biotechnology; and
- **Government and public entities**, such as Innpulsa, Colciencias, or Servicio Nacional de Aprendizaje (SENA, or National Training Service)

However, as seen in our research throughout Latin America, the funders that provide these types of capital are investing in multiple sectors, and few, if any, have deep expertise in healthcare. Many of these multi-sector investors are interested in healthcare investments, but note the challenge of identifying viable businesses that are not catering to high-income segments. The overall health investing landscape in Colombia has not seen considerable activity in recent years and has yet to mature. The dearth of health-specific expertise, combined with uncertainty around regulatory change, has caused many investors to shy away from health investments.

MARKET GAPS AND OPPORTUNITIES

As noted by one expert interviewee, the structure of Colombia's health system inherently reflects characteristics of a public-private partnership (PPP); that is, both EPSs and public hospitals manage public resources under government regulation, but are privately administered with independent governing bodies (i.e., separate boards of directors) and without government oversight of day-to-day management. Our research indicates that several opportunities in healthcare exist in which PPPs could be developed, strengthened, or formalized. We also identified the potential for expanding the use of telemedicine and task-shifting models to increase access, particularly in rural areas.



There is opportunity to create PPPs in healthcare, though persistent challenges exist. Although there is a legal framework in place for PPPs in Colombia, there have not been many examples in the healthcare sector, likely due to difficulty in aligning incentives, general fragmentation within the sector, and lack of administrative capacity and legal expertise to manage a PPP. While most examples of PPPs in Colombia are outside the healthcare sector, our research uncovered a handful of examples within healthcare that have proven successful. For example, Savia Salud is an EPS launched as a PPP between the Antioquia state government, Medellín municipal government, and a local family compensation fund, Comfama. This EPS was designed to fill a gap when many local EPSs serving the SR in the state of Antioquia went bankrupt a number of years ago. Savia Salud continues to successfully operate as a PPP. While this is a rare example, our research indicates that there are several areas in healthcare in which PPPs are worth exploring as potential opportunities:

- **Public hospital management:** While public hospitals are generally self-managed entities with their own boards of directors, some continue to struggle financially, and/or are prone to management interference from local politics. An infusion of management expertise from the private sector, alongside increased insulation from local politics through management from a private-sector entity, could prove beneficial.
- **Development of new EPSs:** In areas where there is clear alignment of public and private actors, such in the case of Savia Salud, PPPs can create sustainable EPSs.
- **Outsource technical expertise:** In areas of healthcare where the private sector has a disproportionate amount of expertise, including technical and management skills, government partnership and support can leverage this and increase the scale of impact. As we observed in Mexico, there may be opportunity in Colombia for the public sector to outsource machines, technical equipment, and/or non-clinical staff, avoiding challenges from physician unions.

However, it is important to note that interviewees also pointed to a growing wariness on the part of private sector investors to engage with government. While significant challenges exist in aligning public and private interests in the initial development stages of PPPs, even more challenging is navigating the ongoing changes over the years as the principal actors from the public sector side turn over with election cycles.

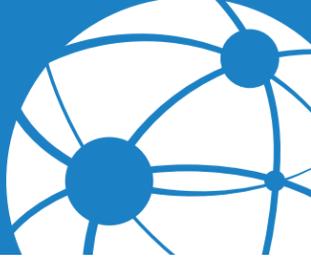
One example of this is the EPS Salud Total, which initially entered into a well-regarded and productive PPP with the city of Bogota, and subsequently weathered a difficult working relationship following a change of power with an election. Hopes are high that the relationship will improve with the next election, but the example illustrates the systemic challenge presented by the nature of ever-changing leadership in the public sector.

The recent development of a regulatory framework for telemedicine has created new potential, but misaligned incentives prevent expansion of this mechanism. As noted above, regulatory changes enacted in 2014 have allowed private companies, such as Ubiquo Telemedicina, to integrate into the EPS billing codes. Expansion of telemedicine models would be especially useful in rural areas where interviewees have stated there are disproportionately large access challenges (compared with urban areas). Telemedicine models could also be leveraged for screening (such as skin cancer screening), or as a monitoring solution for ongoing illness (whether chronic or end-of-life) for home-bound patients.

However, misaligned economic incentives, along with cultural barriers, are impeding greater uptake. Most providers receive a significant portion of their budgets from EPSs, the structure and incentives of which do little to encourage adopting and integrating new technologies. We also heard from interviewees about challenges related to a lack of experience amongst providers, leading to misunderstandings

of where and how telemedicine could be deployed, even in cases where there is a sufficient budget for implementing new technologies. Ongoing challenges for telemedicine expansion include helping doctors, medical associations, political figures, and others key actors to better understand how to implement telemedicine most effectively (both technologically and within the current regulatory environment).

Due to urgent workforce shortages, task-shifting models may be more feasible in rural areas. Although there are significant regulatory challenges hindering the adoption of task-shifting models, as detailed earlier in this chapter, this approach could help to fill the large capacity gap in rural areas. Data from our interviews suggests that rural areas provide more opportunity to experiment with task shifting - even in the face of regulatory barriers—because the larger gap in provider capacity, especially for medical specialties and subspecialties, makes existing laws far more difficult to enforce without making it impossible to deliver care altogether. This less stringently enforced regulatory environment may make experimenting with new models possible.



EMERGING HEALTHCARE INNOVATIONS IN COLOMBIA

Several new healthcare innovations are emerging in Colombia in response to gaps noted above. However, the existing regulatory environment and potential for future significant reforms has limited the extent of innovation in several areas, namely delivery and insurance innovations. Of the innovating companies that we discovered in this research, the majority were either developing new products and technologies or were models designed to solve consumer-facing challenges in care delivery, such as wait times.

We identified two primary themes among innovative models in Colombia: new products and technologies, and new consumer solutions. For a list of the key organizations in Colombia studied for this report, see page 53.

New Products and Technologies

Several innovators have developed promising new technologies with the potential to be disruptive in Colombia as well as in other markets. These products include new diagnostics, biotechnology, and telemedicine offerings.

innovator spotlight

Ubiquo Telemedicina

Ubiquo Telemedicina's initial focus was on intra-hospital technology solutions to facilitate the storing and sharing of medical information, in particular images (such as CTs or ultrasounds). They primarily sell their technology to private providers, but have begun to work with public hospitals as well. They also have expanded their focus from intra-hospital technology to include telemedicine, and have added telemedicine components to their model. As of December 2015, Ubiquo Telemedicina was in more than 75 facilities around Colombia.

Keraderm

Keraderm's product is a high-quality alternative to traditional skin grafting techniques. Using a small sample of healthy skin (0.5 to 1.0 cm²) and a blood sample from the patient, Keraderm can cover areas as big as 300 cm² - some key benefits include that Keraderm does not experience problems of immune rejection and the procedure does not need to occur in an operating room. Traditionally, Keraderm would be used for burns or diabetic ulcers, but they are moving towards application to chronic conditions. They are also moving away from working with plastic surgeons and towards working with other physicians, such as general practitioners.

New Consumer Solutions

Several innovators have created new solutions that challenge the way products and services are currently delivered in the Colombian healthcare system, including new e-commerce platforms that reduce costs to consumers and health plans that provide faster access to healthcare.

innovator spotlight

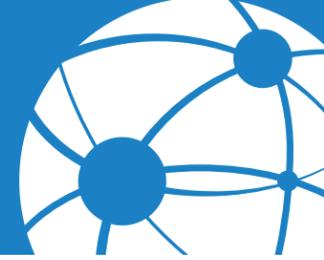


Bive

Bive acts as a bridge between healthcare consumers and private providers, helping to connect low- and middle-income Colombians with high-quality, timely healthcare that they can afford. Bive has aggregated a network of healthcare providers in the state of Caldas who have agreed to offer services at discounted rates to Bive members. On the consumer side, Bive sells annual memberships for approximately \$40 USD that cover the purchasing individual and up to five additional family members. With this Bive membership, customers are able to schedule appointments with providers in the Bive network at discounted rates, and they are guaranteed to see a provider within seven days.

Lentesplus

With Lentesplus, consumers can purchase contact lenses that are prescribed to them by a doctor via phone or the Internet. Patients can pay to visit a certified clinic in the Lentesplus network for an eye consultation. Lentesplus offers prices that are about 30% lower than optical shops, as well as fast delivery - contact lenses are delivered in 1-2 days within major cities. By purchasing products that are approved and registered by INVIMA (Instituto Nacional de Vigilancia de Medicamentos y Alimentos) from certified retailers, they ensure high-quality products for consumers. Lentesplus emphasizes both customer service and social impact. For each box of contacts purchased, they donate a pair of glasses to a child in need. Lentesplus has launched in Colombia, Mexico, and Chile, with plans to expand to additional Latin American countries in 2016.



Interviewee Organizations - Colombia

The list below includes the organizations of our expert interviewees who contributed their time and insights to this study. The views and opinions expressed by interviewees do not necessarily reflect the official policy or position of any individual organization listed.

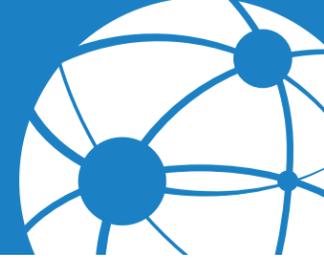
Organization

ACEMI (ASOCIACIÓN COLOMBIANA DE EMPRESAS DE MEDICINA INTEGRAL)
 ACUMEN FUND
 ANDI (ASOCIACIÓN NACIONAL DE EMPRESARIOS DE COLOMBIA)
 ASÍ VAMOS EN SALUD
 ASOCAJAS
 BIVE
 COMPARTAMOS CON COLOMBIA
 COSESAM
 FIO CORPORATION
 FONDO INVERSOR
 GSK (GLAXOSMITHKLINE)
 INDEPENDENT CONSULTANT
 KERADERM
 LENTESPLUS
 LGT VENTURE PHILANTHROPY
 MAS EQUITY PARTNERS
 MINISTRY OF HEALTH (MINISTERIO DE SALUD Y PROTECCIÓN SOCIAL)
 ROCHE
 SANOFI
 UBIQUO TELEMEDICINA
 UNIVERSIDAD DE BOGOTÁ JORGE TADEO LOZANO
 UNIVERSIDAD DE LOS ANDES
 UNIVERSIDAD DE LOS ANDES (NEW VENTURES COLOMBIA)

Principal Innovative Organizations - Colombia

The list below includes the key innovative organizations in Colombia identified in this study.

Innovator (Year founded) TARGET SETTING LEGAL STATUS	Offering	Health need
1DOC3 '13 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - any
BIVE '12 Rural, Urban, Peri-urban For-profit	Systems support, Financing	Multiple health needs - any
FIO CORPORATION '06 Rural, Peri-urban For-profit	Product or technology	Multiple health needs - limited scope
KERADERM '08 Urban For-profit	Product or technology	Other
LENESPLUS '13 Urban For-profit	Product or technology	Eye care
PARALIFE '06 Rural, Urban, Peri-urban For-profit	Financing	Multiple health needs - limited scope
UBIQUO TELEMEDICINA '09 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - limited scope



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- ⁹ Giedion, Ursula, and Manuela Villar Uribe. "Colombia's Universal Health Insurance System." *Health Affairs* 28, no. 3 (2009): 853-863.
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List of Acronyms

•	ANDE	Aspen Network of Development Entrepreneurs
•	CIES	Centro de Integração de Educação e Saúde (Center of Education and Health Integration)
•	FHS	Estratégia Saúde da Família (Family Health Strategy)
•	FGV	Fundação Getúlio Vargas (Getulio Vargas Foundation)
•	GIFE	Grupo de Institutos, Fundações e Empresas (Group of Institutes, Foundations and Companies)
•	MNC	Multinational corporation
•	NCD	Non-communicable disease
•	SUS	Sistema Único de Saúde (Unified Health System)

BACKGROUND

Like Mexico and Colombia, Brazil is a transitioning economy with disparate geographic development and new epidemiological challenges related to chronic conditions. Brazil is one of the five largest countries in the world, with a population of over 200 million people, over 84% of whom live in urban settings. Two significant changes in the population have increased the burden on an already- strained healthcare system. First, the proportion of people older than 60 years nearly doubled between 1960 and 2010.¹ Second, non-communicable diseases (NCDs) - particularly cardiovascular diseases - have become the primary cause of all deaths in Brazil.² Adding to the health system's challenge is Brazil's dramatic, maldistributed socioeconomic development. Although the free universal health program was established in 1990, stark regional disparities for accessing treatment and services persist, resulting in poorer health outcomes for certain regions of the country. For example, infant mortality in 2007 was 2.2 times greater in the north of the country than in the south.³

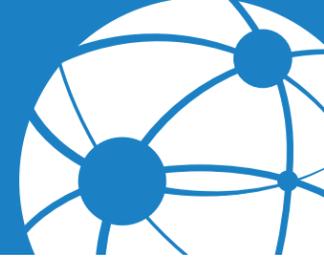
The government plays an enormous role in healthcare delivery, payment, and regulation in Brazil, with the private sector playing a strong supplementary role. The 1990 creation of Brazil's publicly-funded Unified Health System, or Sistema Único de Saúde (SUS), decentralized Brazil's former healthcare system, shifting healthcare delivery and financing responsibilities to the state and municipal level, with municipalities responsible for management and provision of primary care services, and states helping to set policy goals and provide both technical and financial assistance.⁴ Prior to the creation of the SUS, half of Brazilians had no health insurance coverage; two decades later, more than 75% of the population depends exclusively on the SUS for health insurance. Similar to Mexico, however, insurance coverage does not always lead to true access. Many citizens covered by the SUS still face significant access issues for a variety of reasons, including challenges in healthcare worker retention across municipalities due to variance in wage structures, as well as long wait times for appointments, surgeries, and certain medications.⁵

As a result, many Brazilians choose to seek care in the private sector to avoid delays and administrative frustrations. The government and employers offer businesses and individuals the option to purchase supplemental healthcare through private providers, a process regulated by the National Supplementary Health Agency (Agência Nacional de Saúde Suplementar), which monitors private plan costs and ensures that a minimum quality of private services is met.

Brazil's decentralized political system gives significant autonomy to states and municipalities, which is reflected in healthcare financing, delivery, and regulation. At the federal level, the Ministry of Health establishes the national guidelines for healthcare (at primary, secondary, and tertiary levels) and provides financial support to municipalities and states for service delivery. States coordinate the different levels of care, linking the basic and complex services, and transfer funds to the municipal level. Municipalities bear the primary responsibility for the provision of basic care as well as patient referral.⁶ This decentralized model of care delivery is designed to promote care that is more responsive to regional needs; however, poor communication and resource management between federal, state, and municipal entities introduce bottlenecks that weaken the efficiency of the model. Administrative challenges are amplified by tensions between the public and private sector, particularly with regard to the provision of high-complexity services, management of referral systems, and reimbursement.

Access to Healthcare

While healthcare coverage through the SUS in Brazil is universal (with the new constitution framing it as a fundamental right of the population), access to care still lags considerably. Brazil's declaration of the "right to health" states that all citizens are entitled to free healthcare. Since the creation of the SUS, access to care has continued to increase with around 71% of Brazilians reporting use of a routine health service in 1998, increasing to around 80% in 2003.⁷ The increased access is due in part to Brazil's reinforcement of their primary care system, through the creation of programs such as the Family Health Strategy (see Box 1), which have increased healthcare utilization in low-income states and helped to reduce geographic disparities in utilization. The Mais Médicos program has also helped to increase access to healthcare by recruiting and better incentivizing both Brazilian and international healthcare professionals (many of whom are from Cuba) to work in underserved areas of Brazil. As of mid-2015, Mais Médicos had recruited more than 18,000 healthcare professionals, placing them in over 4,000 municipalities throughout Brazil.⁸



Box 1: Estratégia Saúde da Família, or Family Health Strategy (FHS)

Estratégia Saúde da Família, or the Family Health Strategy (FHS), is the bedrock of the SUS program. What began as a maternal and child health program in the northeastern states in the early 1990s is now one of the largest publically-funded primary care initiatives in the world. More than 39,000 teams of physicians, nurses, nurse assistants, and community health agents are working together to provide basic health services to approximately 62% of the population.⁹

FHS primarily focuses on the use of community outreach to universalize basic health services. Community health agents visit each household within their assigned micro-area on a monthly basis and have three general tasks: 1) educating household members on strategies to detect violence and trauma, 2) assessing potential risk factors for hypertension and diabetes, 3) linking households to government welfare programs that they might not have otherwise heard about.¹⁰

Strong evidence suggests that FHS has improved detection of tropical diseases and reduced inequities in access to healthcare. However, rapid expansion from the poorest regions in Brazil to municipalities has been challenged by a shortage of physicians. Sustained financing and physician recruitment is necessary for FHS to continue to expand to middle-class and urban centers lacking basic primary healthcare services.¹¹

Despite insurance coverage, however, many citizens still face significant access issues, as noted above. Most key contacts we interviewed reported long wait times, ranging from two to six months, to access specialty care. Those wait times are linked to poorer health outcomes for patients. While rural areas fare worse when accessing specialty care, this is not necessarily true for primary care services, which have been widely expanded in rural areas by the FHS.

Provider shortages, mostly specialists but also generalists, appear to be the main reason for long wait times. Interviewees reported shortages for medications, such as hypertension and diabetes drugs, as another supply chain issue that contributes to long wait times for patients. Key contacts also reported persistent difficulties for patients in navigating the healthcare system generally. This has been validated by the emergence of startups like Saútil, which improves access to general health information, and information specific to navigating the Brazilian healthcare system, through both a website and physical kiosks in public areas.

In the past decade, Brazil has attempted to reform human resource management to promote an increased supply of health workers and stem their uneven geographical distribution. Between 2006 and 2010, the Ministry of Health implemented healthcare provider training programs that emphasized increased participation in management and greater job security.¹² It also collaborated with the Ministry of Education to create more undergraduate programs that focus on primary healthcare and train auxiliary health workers for both primary and complex care. In the same time period, the number of registered physicians grew by almost 10% and the number of training programs for nurses increased by 37.5%.

Despite these improvements, however, at 1.9 physicians per 1,000 people, Brazil's ratio of doctors to the population is lower than other Latin American countries such as Argentina and Mexico, with the majority of physicians concentrated in the southeast region. In 2009, about 52% of physicians practiced in the southeast compared to only about 8% in the north.¹³

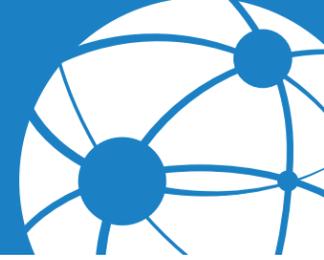
Private health insurance is only affordable for about a quarter of the population (with higher rates in the south and southeast regions), creating access disparities between the wealthy, who can and do use the private sector, and the poor, who typically cannot. Approximately 30% of Brazilians between 30 and 59 years old have private health insurance; this percentage jumps to over 50% among wealthier individuals.¹⁴ Expensive private health insurance is only affordable for about 25% of the population nationwide, though this figure is reportedly higher in urban areas. Our research indicates that the number of private insurance enrollees has increased in recent years in the northeast, largely driven by the growth of jobs in the formal sector where supplemental private insurance is offered as an optional employee benefit.

Quality

Like many other countries, there are pockets of excellence in Brazil's urban areas, such as the Cancer Institute of São Paulo and InCor Cardiac Hospital, but these bright spots are not evenly distributed and mechanisms for enforcing consistent quality standards are not well coordinated.

As noted above, municipal governments are principally responsible for the provision of primary care and patient referral. To a lesser extent, they also play a role in ensuring quality of services, though monitoring of public programs and regulation largely occurs at a federal and state level, with several agencies coordinating the SUS management policy and developing evaluation mechanisms for primary and specialized services. The National Program for Access and Quality Improvement in Primary Care, implemented by the Ministry of Health in cooperation with municipalities, works to regularly evaluate primary care quality across seven major categories, ranging from maternal and child health, to mental health, to oral health.¹⁵

The public and private sector often remain at odds with each other, especially over reimbursement, leading to variation in quality of care delivery. The responsibility of reimbursement is often unclear, since patients (even those with private insurance) are entitled to use public services. Although SUS reimbursement rates are often inadequate to cover costs, private providers remain tied to the SUS system as it accounts for the vast majority of their patients.¹⁶ At times the financing of the SUS program at times over-compensates complex procedures and under-compensates simple procedures, creating incentives that may favor hospital-based care over ambulatory care. Private facilities may be incentivized by SUS reimbursement policies to perform certain procedures; for example, higher reimbursement by the SUS for cesarean sections than for normal deliveries has led to a spike in the number of cesareans performed in the private sector.¹⁷



Quality issues have become a primary barrier to use of the public system. Reasons for lack of use of the SUS care delivery system have shifted over time. While the most prominent reasons cited for dissatisfaction were previously financial barriers (such as cost of transportation to care locations) and poor infrastructure, these have been overshadowed more recently by quality indicators, such as long wait times and unfriendly staff.¹⁸

Cost

Although care is ostensibly free to patients via the SUS, the lack of viable public sector options leads to significant out-of-pocket spending for patients, while also driving up costs for the entire health system. Public expenditures for health have increased considerably since the early 1980s.¹⁹ Public health expenditures in 2013 accounted for 48.2% of the total health expenditures in Brazil, up from 40.3% in 2000.²⁰ Despite the steady increase over the last decade, more than half (51.8%) of total health spending remains private. Access issues in the public sector drive patients to seek care in the private sector at their own expense, and diagnosis for many diseases (including cancer) is happening at late stages. This increases overall costs both for patients, whose out-of-pocket spending represented 29.9% of total spending on health in 2013, and the health system as a whole, faced with the burden of more expensive later-stage treatments for complex conditions.

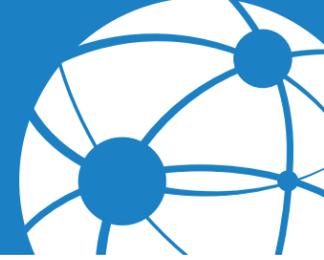
Public hospitals are largely overburdened, inefficiently run, and poorly designed to provide continued care or referrals. System leaders are interested in moving away from the prevailing fee-for-service model to help contain costs. Improving process efficiencies, patient flow, top- and middle-management skills, and communication systems in the existing hospitals could help to drive down costs. Many hospitals were built to address acute and/or complex cases, but given the country's rising incidence of NCDs, these facilities dedicate resources to treat patients with long-term chronic conditions that could be referred to existing primary care units. Another related issue is that municipal leaders often choose to build new facilities rather than upgrade existing ones because it is perceived to create positive political capital, leading to a large number of inefficiently-run hospitals in Brazil. Interviewees indicated the medium- to long-term possibility that some small public hospitals might close or limit the scope of services provided, to mitigate the inefficiencies of the current system. The Ministry of Health is reportedly interested in moving away from a fee-for-service model as another cost-saving mechanism, but will likely face stiff pushback from physician unions. Likewise, some private hospitals are considering alternatives; for example, Albert Einstein Hospital in São Paulo is experimenting with developing a health system in low-income neighborhoods using outcome-focused payment models, rather than exclusively fee-for-service models.

INSIGHTS INTO THE INNOVATION CONTEXT

Our analysis of the innovation context in Brazil identified several factors in the ecosystem that are shaping the emergence and scale of innovative models. By and large, these ecosystem factors present challenges for innovation: the divide between the public and private sector, limited labor flexibility, a public tendering process that is challenging for innovations and small businesses, and a lack of early-stage funding for entrepreneurs. However, we also found several stories of success and a small but growing support system for innovation in Brazil.

The large divide between public and private sectors in healthcare results in many challenges for patients and the business sector alike. Driven by divergent perceptions about who should be involved in healthcare provision (the public sector versus the private sector), this divide is often underpinned by ideological differences (capitalist versus socialist visions for the country). Many feel that healthcare, upheld by Brazilians as a fundamental human right, falls under the government's purview and should not be developed as a business sector; however, a smaller community of entrepreneurs and investors increasingly sees it as an area for private sector development.

Reciprocal knowledge is lacking between the two sectors, and very few interviewees in either sector had significant work experience in or networks with the other sector. There is little cross-pollination of new knowledge and innovation. Private sector expert interviewees were generally completely unaware of relevant healthcare innovations and players in the public sector. For example, few of the investors interviewed in Brazil had heard of the government-run FHS, which is well known in relevant circles outside of Brazil. This disconnect is partly due to the fact that there are few formal mechanisms for collaboration between the sectors. This also results in challenges for care coordination for patients between public and private providers, with many reports of poor referral handoffs.



Box 2 Hospital das Clínicas at the University of São Paulo

Hospital das Clínicas is working to streamline the testing and adoption of innovation. It is currently in the first year of building an internal platform to systematically evaluate and pilot innovations with external partners from both the public and private sector.

Typically, individual doctors build their own partnerships to adopt innovations from an external party. These partnerships are built in an ad hoc way, and lessons from each project are not captured consistently for quality improvement.

The new internal platform is being designed to provide a common platform to address topics that cut across all innovation projects, such as legal, ethical, financial, and administrative issues.

Though most projects piloted through this platform to-date are technological in nature, there is one project currently in its pilot stage that addresses workflow in oncology. Hospital das Clínicas will consider other process improvement innovations in the future.

Technology innovation receives more attention than process or business model innovation, particularly in the public sector. Government providers are reportedly trying to think more systematically about innovation, but this strategy is in early-stage development. Public hospitals use a tendering process for sourcing new devices and technologies. Generally, the government has a reputation for only working with big companies (whether Brazilian or MNCs), and typically avoids working with smaller companies or startups. Interviewees noted new regulations encourage sourcing innovative products from small- and medium-sized companies, but these efforts have yet to gain significant traction.

There are a few early adopters of new technologies among public providers. In select examples, such as that of Hospital das Clínicas (see Box 2), these organizations are explicitly building systems and processes to evaluate and integrate new innovations into their operations. Even in very advanced hospitals like Hospital das Clínicas, there is still an internal ideological divide: some staff members believe they should not work with private companies at all, as they are a public hospital. While this sentiment does appear to be slowly changing over time, key contacts noted this tension at the time of the interviews.

Private hospitals demonstrate more variation in the acquisition process, sometimes using a requirements list or relying on previously established vendor relationships. Some large private hospitals are starting to consider patient flow and other process-related issues, though these initiatives appear to be in the nascent stages, with a handful of leading-edge organizations like Albert Einstein Hospital standing out as early adopters. We found almost no examples of government providers adopting business model and/or process innovations; innovation adoption in the public sector was focused almost exclusively on technological innovations.

The scarcity of process innovation is due in part to the lack of labor flexibility, which limits implementation of task-shifting models. Similar to Colombia, many interviewees shared that existing laws (regardless of their original intent) and politically powerful unions make it difficult to implement healthcare innovations that involve task shifting between healthcare roles. However, we did find one Brazilian example of task shifting in Projeto CIES, which pairs a nurse or technician with a physician for consultations. The nurse or technician manages documentation of the visit, allowing the physician to see a higher volume of patients per hour and to spend more time focused on the patient and less time documenting the consultation.

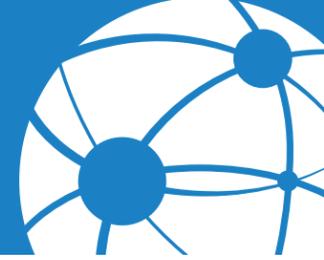
For innovators, partnering with the public sector is made difficult by long repayment timelines, opaque tendering processes, and corruption. Public-private partnerships in healthcare exist in Brazil but face significant challenges. On the positive side, government partnerships can be extremely beneficial to private-sector players for a number of reasons, including the possibility for rapid large-scale expansion, as well as access to a large population of patients with government insurance who are otherwise unable to pay out-of-pocket for care.

On the negative side, partnering with the government can bring many challenges, in part because the process is not a uniform one. A given organization must build multiple relationships, and ultimately make sales to a large number of city and municipal governments individually in order to scale through public sector healthcare provision. The complicated web of stakeholders impedes success. To scale nationwide across Brazil would require partnering with 5,500 city governments, creating a large relationship management challenge.

Many private sector partners reported significant unexpected delays in signing contracts even after all parties had agreed to terms. Additionally, the government is notorious for slow repayment on existing contracts, a problem only intensified by Brazil's struggling economy. Brazil's economy contracted sharply in 2014 and 2015, and is largely expected to be entering its worst recession since the Great Depression.²¹ Unemployment is at a five-year high and current data suggest the economy will continue to contract.²² As one private sector innovator laments, "SUS payment is like death... it always comes, but you never know when it will." Corruption indicators, including unlisted fees, issues with obtaining permits, and bribes requested at the municipal level, have also been reported. Public providers often use a competitive tendering process

to evaluate new options, which can shut out novel solutions that don't yet have competitors. For example, GlicOnline, a mobile app that facilitates self-management of diabetes, cannot work with the public sector because competitors are required for a tender process, but there are not any current companies providing the same service. There have also been reports of government requirement lists being so specific as to explicitly target a particular vendor. In spite of these many challenges, we did find several examples of effective partnerships between public and private sector actors, including Saútil and Projeto CIES (see spotlight on next page).

**"SUS PAYMENT IS LIKE DEATH... IT ALWAYS COMES, BUT YOU NEVER KNOW WHEN IT WILL."
PRIVATE SECTOR INNOVATOR**



innovator spotlight



Saútil

Saútil provides an online website with general medical information and tips to help patients navigate the Brazilian healthcare system. Saútil's initial business model centered on selling online advertising. They then tried selling access to a hotline to talk with nurses, but individuals were unwilling to pay for advice alone. After these first two business models proved unsuccessful, Saútil is now pivoting to a model that relies on partnership with municipalities to integrate Saútil's offering into existing public health infrastructure, including government websites and free public kiosks.

Projeto CIES

Projeto CIES is a nonprofit that provides a variety of mobile and semi-mobile clinic solutions (vans, converted shipping containers, etc.) to increase healthcare access for low-income populations in remote geographies. CIES offers a wide variety of services tailored to local needs, from primary care screening to advanced diagnostics, imaging, and specialty care services. The primary innovation is in their technology deployment, management structures, and task-shifting staffing models. The strategy is to partner closely with the government and help to improve access for difficult-to-reach populations. In São Paulo, regulations identify CIES as the default provider for these services. Elsewhere, they are reimbursed for most or all services by the SUS, though they are responsible for their own startup costs when expanding to a new area.

There are significant funding gaps for innovators, especially early-stage funding. Similar to what we observed in Colombia and Mexico, a lack of health-sector focus and risk tolerance among funders leads to significant funding gaps for private-sector healthcare innovators in Brazil. Both commercial and impact investors are beginning to look at healthcare as a major sector of interest, but most or all of these funds are still sector agnostic overall, and this expertise will take time to develop. There is also a funding gap between acceleration programs and Series A funding. Most angel investors in Brazil have a reputation of being risk averse, not having expertise in healthcare, and only investing relatively small amounts when they do make investments.

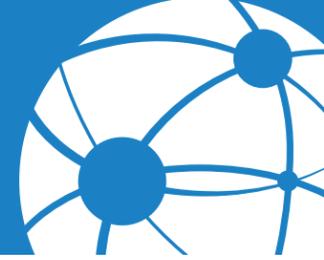
There are very few grants available for healthcare innovation, especially from Brazilian funders. Our findings indicate that this is related to a broader sentiment that healthcare is a space where the government alone should operate, not the private sector.

Additionally, some Brazilian corporate foundations are experiencing significant budget cuts due to the current unfavorable economic conditions in Brazil. We found almost no examples in Brazil of other types of healthcare funding mechanisms, such as crowd funding, social impact bonds, and corporate strategic investments, that support entrepreneurship in other countries.

The development and growth of innovation in healthcare is hampered by a lack of experienced entrepreneurs and managers and a fledgling support ecosystem. A lack of management training, for both public and private sector healthcare managers, hinders the launch, adoption, and growth of innovative models of care. Most hospital or clinic leaders are doctors by training or studied public health, and do not have explicit training in business management. A handful of new initiatives, some within medical school programs, are seeking to bridge the divide between healthcare and management training. We found examples of such initiatives at Fundação Geútlío Vargas (FGV), University of São Paulo, and Universidade Nove de Julho. Some interviewees also reported that because the entrepreneurial culture in Brazil is still burgeoning, it is difficult to build teams with sufficient resilience to face the uncertainty inherent to startup environments, and challenging to find experienced talent willing to partner with green founders.

Entrepreneurs, investors, and other stakeholders are often operating in isolation, or building bonds slowly through their own personal networks and/or utilizing adjacent ecosystems. These related ecosystems include commercial entrepreneurship (coordinated by organizations like Endeavor); social entrepreneurship (coordinated by organizations like Artemisia; Aspen Network of Development Entrepreneurs, ANDE; and Potencia Ventures); the philanthropic community (coordinated in São Paulo by the Grupo de Institutos, Fundações e Empresas, GIFE) and traditional hospital-based healthcare (coordinated by Empreender Saude and related companies, as well as the public sector to some extent).

While these related networks provide some degree of support, the healthcare innovation ecosystem remains nascent, largely disconnected, and poorly coordinated. Interviewees noted that the biggest gap in these adjacent ecosystems is the lack of involvement by both public sector actors and individual entrepreneurs, though investors, accelerators, capacity builders, and network organizations are typically more involved.



MARKET GAPS AND OPPORTUNITIES

Our research identified several opportunities for healthcare innovators to fill significant market gaps and make a positive impact in Brazil's healthcare system. These opportunities largely focus on the fragmented relationships between the public and private sectors. Both sectors play critical roles in the delivery of care but often do not work in a complementary fashion, negatively impacting cost, quality, and access. New models that leverage the strengths of both sectors toward common goals have the potential to transform the experience of healthcare delivery for Brazil's population.

Building linkages between the public and private sectors. As noted, there is a large gap between the public and private sectors, which exists for a number of reasons, spanning from ideological (differing views about whether the private sector should be involved in healthcare) to operational (lack of formal mechanisms for collaboration). In spite of these many challenges, we did find illustrative examples of effective collaboration between public and private sector actors, including Projeto CIES, which has been operating since 2008, and emerging partnerships like Saútil. Both of these examples harness the relative flexibility of the private sector to respond to market needs, while also leveraging the public sector's reach. Improving links between the two sectors could increase cross-pollination of good ideas and innovations.

Building paths to scale that mix public and private payers. Private sector innovators balance public sector collaborations with other scaling strategies to maintain sustainability in the face of public-private partnership challenges. Given the previously described challenges of working with the government, a number of organizations who do partner with the government also explicitly build direct-to-consumer or business-to-business strategies. This protects them from the risks to cash flow and financial sustainability that come with dependency on the government.

For example, AssistCare, a home-care nursing agency akin to in-home hospice care in the United States, is primarily scaling through city contracts, but also pursuing a business-to-business sales strategy by building partnerships with private insurers. AssistCare reported up to year-long delays in receiving payment from the SUS, highlighting the need to diversify revenue streams beyond public sector reimbursements.

Another example is ProRadis, which offers a set of software solutions that improve clinic efficiency and is designed to drive down costs and improve quality. These solutions include clinic management tools (e.g. scheduling, electronic health records, and enterprise resource planning), telemedicine features (e.g. generating reports, sharing images), and clinic capacity optimization features (e.g. ability to see capacity and demand distribution across MRI and other imaging machines). ProRadis's primary scaling strategy is through sales to public providers, but they are complementing this with a direct-to-consumer line comparable to a Groupon for healthcare, currently in early stages of testing.

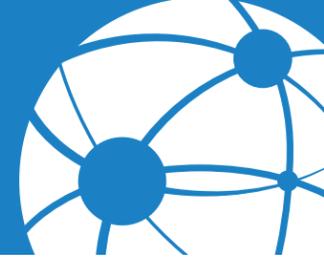
Facilitating access to information and healthcare in a complex, highly-fragmented system.

As noted above, the healthcare system faces significant challenges from the consumer perspective, including long wait times for appointments, lack of specialists, and poorly-coordinated referrals between providers. There is a clear opportunity for new models that facilitate access to both health information and medical professionals and help patients navigate the system. Most of the examples we saw in this field are technology-based.

As in the United States and other markets, lower barriers to entry and smaller financial capital needs have contributed to a spike in the number of information technology startups in Brazil, with growing smartphone and internet usage creating an expanding consumer base. However, there are still significant challenges to developing a sustainable business model for technology-based companies designed to improve access to medical information and care delivery. For example, from a direct-to-consumer perspective, information- and education-based apps that provide preventive health guidance generally require a third-party payer, as individuals are typically unwilling to pay for information alone.

Additionally, the regulatory environment for telemedicine and mobile health (mHealth) is murky. In some cases, the existing regulations for telemedicine are sufficiently vague that companies operate in a gray area of legality. Consultation apps are largely illegal under current regulations but, in rare cases, companies have found ways to offer these within the regulatory scope. In other cases, the relevant government regulatory bodies have not come to consensus about which

body should regulate in a given area. Interviewees reported that doctors are generally in agreement about using technologies that enhance doctor-to-doctor communication (e.g. sharing X-ray images between primary care doctors and specialists) but are more resistant to adopt doctor-to-patient models (e.g. providing medical consultation over video conferencing or through smart phone apps).



EMERGING HEALTHCARE INNOVATIONS IN BRAZIL

Despite the relatively young healthcare innovation community in Brazil, our research uncovered a number of interesting examples of innovative models, mostly in care delivery and information technology. We found almost no examples of innovations focused on workforce training or healthcare financing. With regard to the former, some models we studied have training elements but none function as stand-alone training models. With regard to the latter, the lack of financing organizations is likely due to the large government role in financing healthcare, and the lack of perceived opportunity outside of the high-income segments (about 25% of the population) that are currently served by private insurance in addition to the SUS. As observed with training innovations, some organizations are actively exploring integrating a financing component into the model, but we did not yet find any stand-alone examples.

We identified three primary themes among innovative models in Brazil: care delivery, information technology, and medical devices. For a list of the key organizations in Brazil studied for this report, see page 73.

Care Delivery

Many innovations identified through our research in Brazil are focused on delivering low-cost, quality treatment through operational efficiencies; however, few are actually gaining such efficiencies through new innovations in their management structure, technology deployment, or business model. We found a few high-quality examples with sophisticated models that appear to have strong management teams, including Projeto CIES, dr.consulta, and Clínica SiM.

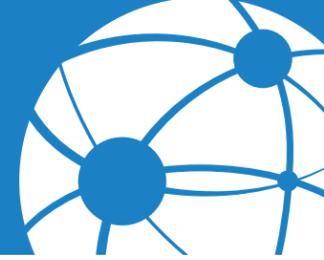
innovator spotlight

dr.consulta

dr.consulta's model is designed to provide healthcare to low-income families in São Paulo who are seeking an alternative to the long wait times in the public system. This segment of the population is traditionally unable to afford private care. dr.consulta is a network of clinics that brings together primary and secondary care, offering consults as well as lab and imaging tests in over 30 medical specialties. With dr.consulta, wait times are significantly shorter than with the public system, and prices are lower than average São Paulo market prices. These improvements are made possible by innovative practices in patient flow, constant process improvement, integration of services in each location, and strategically locating clinics in high-need, low-income neighborhoods.



dr.consulta clinic
São Paulo



Medical Devices

Our research found a handful of medical device examples, all of which are relatively early in the product lifecycle. Some interviewees noted a challenging regulatory pathway for medical device manufacturing in Brazil; in one example, a medical device company in Brazil outsources to Chile for device production and imports the product back into Brazil for sale.

Information Technology

We also identified many information technology models, with most examples in this category designed to facilitate access to information and/or medical professionals. Theoretically, technology-based solutions have the potential to be highly scalable and cost effective, resulting in increased access for patients; however, as in other areas of the world, it is too early to analyze outcomes related to improving access.

innovator spotlight

ToLife

ToLife has created a platform that helps to streamline emergency departments by facilitating the classification of patient risk to optimize triage and patient flow, with the ultimate goal of improving access to services and quality of care. The hardware component of ToLife's solution is the TriusOne triage station, which incorporates the equipment needed to assess a patient's risk rating - the TriusOne diagnostic screening station includes features such as a touch screen monitor and equipment to take clinical measurements. ToLife's software products - Emerges and Module Decision Support - complement TriusOne, thereby forming a platform to streamline risk classification, clinical prioritization, and patient flow in emergency departments, and facilitate data and results management. ToLife sells to a mix of public and private providers, and its product has been implemented in over 5,000 health facilities both in Brazil and internationally.

Magnamed

Magnamed develops pulmonary ventilation and anesthesia products for emergency care and intensive care units, some of which focus on neonatal issues. They sell this high-quality equipment at a low-middle cost to public and private providers, both within Brazil and internationally. Magnamed's impact thesis is that making high-quality, cost-efficient devices available to the public sector will improve health outcomes and lower costs across the system over time.

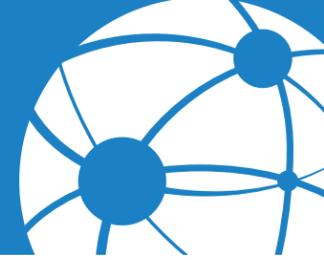
innovator spotlight

GlicOnline

GlicOnline is an app that helps people manage their diabetes by automating treatment. The app uses information about a user's blood glucose levels and food consumption to perform insulin calculations, thereby facilitating and simplifying this process for patients. Patients can share information about their blood glucose, medication, and diet with their care team, and there is a version of the app tailored for doctors. GlicOnline is targeted primarily at Type I diabetics, but has functions for Type II diabetics as well and is expanding in that area. GlicOnline is available on Google Play, and does work with corporates; for example, Merck purchased a package to provide to their patients. They are also doing a pilot with the public sector in Campinas, and hope to eventually integrate into the public sector. In addition to their app, GlicOnline is also playing a role in developing national and international regulations for the telehealth sector, which is currently a gray area in a regulatory sense.

Medicinia

Medicinia is a communication platform for doctors and patients. This technology aims to add a layer of high-frequency, low-intensity interaction to fill the gap in communication that occurs after physician visits. Communication via Medicinia is HIPAA compliant and can be integrated with electronic health records. Medicinia functions with a variety of devices and there are several communication channels available, such as a chat system. The Medicinia platform streamlines hospital workflow and has resulted in increased job satisfaction among physicians and caregivers, decreased delays in medical procedures, and higher turnover in hospital beds. Medicinia sells their platform to private hospitals, and intends to sell to public hospitals.



Interviewee Organizations - Brazil

The list below includes the organizations of our expert interviewees who contributed their time and insights to this study. The views and opinions expressed by interviewees do not necessarily reflect the official policy or position of any individual organization listed.

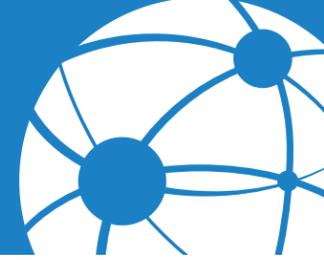
Organization

A.C. CAMARGO CANCER CENTER
 ASPEN NETWORK OF DEVELOPMENT ENTREPRENEURS (ANDE)
 ARTEMISIA
 ASSISTCARE
 BAXTER
 CLINICA GERIÁTRICA SANTO ANTÔNIO
 DR. CONSULTA
 ENDEAVOR
 EXPRESSA GROUP
 FIESP (FEDERAÇÃO DAS INDÚSTRIAS DO ESTADO DE SÃO PAULO)
 COMMITTEE ON HEALTHCARE INNOVATION
 FUNDAÇÃO GETÚLIO VARGAS
 GAG INVESTIMENTOS
 GC-2 (GESTÃO DO CONHECIMENTO CIENTIFICO)
 GLICONLINE
 HOSPITAL DAS CLÍNICAS
 HOSPITAL SÍRIO-LIBANÊS
 INSTITUTE OF GLOBAL HEALTH INNOVATION AT IMPERIAL COLLEGE LONDON
 INSTITUTO QUINTESSA
 INSTITUTO SABIN
 LGT VENTURE PHILANTHROPY
 LIVE HEALTHCARE MEDIA
 LIVOX
 MAGNAMED
 MEDICINIA
 MEDTRONIC
 MOV INVESTIMENTOS
 PERFORMA INVESTIMENTOS
 POTENCIA VENTURES
 PROJETO CIES (CENTRO DE INTEGRAÇÃO DE EDUCAÇÃO E SAÚDE)
 PRORADIS
 PROSPECTIVA CONSULTING
 SANOFI
 SAÚDE CRIANÇA
 SAÚTIL
 SITAWI
 UNIVERSIDADE DE BRASÍLIA, CENTRO DE ESTUDOS AVANÇADOS MULTIDISCIPLINARES (CEAM)
 UNIVERSITY OF ST. GALLEN
 VOX CAPITAL

Principal Innovative Organizations - Brazil

The list below includes the key innovative organizations in Brazil identified in this study.

Innovator (Year founded) TARGET SETTING LEGAL STATUS	Offering	Health need
ASSISTCARE '13 Urban For-profit	Care delivery	Multiple health needs - limited scope
CASA ANGELA '04 Urban, Peri-urban Non-profit	Care delivery	Reproductive, maternal, newborn, and child health
CLÍNICA SIM '07 Urban For-profit	Care delivery	Multiple health needs - limited scope
DR. RECOMENDA '14 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - limited scope
DR.CONSULTA '11 Urban For-profit	Care delivery	Multiple health needs - limited scope
GC-2 '09 Urban For-profit	Systems support	Other
GLICONLINE '04 Urban For-profit	Product or technology	Non-communicable disease - Diabetes
LIVOX '11 Urban For-profit	Product or technology	Non-communicable disease - Other
MAGNAMED '05 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - limited scope
MAIS 60 SAÚDE '13 Urban, Peri-urban For-profit	Care delivery	Multiple health needs - limited scope
MEDCLOUD '09 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - any
MEDICINIA '12 Urban For-profit	Product or technology	Multiple health needs - any
MULTIORTO '04 Rural, Urban, Peri-urban For-profit	Care delivery	Dental care
PROJETO CIES '08 Rural, Urban, Peri-urban For-profit	Care delivery	Multiple health needs - limited scope
PRORADIS '12 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - limited scope
SAÚDE CRIANÇA '91 Rural, Urban, Peri-urban Non-profit	Systems support	Multiple health needs - limited scope
SAÚTIL '11 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - any
SORRIDENTS '95 Rural, Urban, Peri-urban For-profit	Care delivery	Dental care
TÁ.NA.HORA '13 Rural, Urban, Peri-urban For-profit	Product or technology	Multiple health needs - limited scope
TOLIFE '09 Rural, Urban, Peri-urban For-profit	Product or technology	Other
TURMA DO BEM '02 Rural, Urban, Peri-urban Non-profit	Care delivery	Dental care



Citations

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- ¹⁰ Ibid.
- ¹¹ Paim, Travassos, Almeida, Bahia, and Macinko, "The Brazilian health system: history, advances, and challenges," 2011.
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ABOUT INNOVATIONS IN HEALTHCARE

Innovations in Healthcare is a leading global network supporting the scaling and adaptation of promising healthcare innovations worldwide. We aim to improve healthcare and advance health by sourcing, strengthening, scaling, and studying the best healthcare innovations globally. We were co-founded by the World Economic Forum, McKinsey & Company, and Duke University in 2011, and operate as a nonprofit organization hosted by Duke in North Carolina, USA. Over five years, we have developed a network of 67 leading healthcare innovators working in 47 countries and serving over ten million people.

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