

INNOVATION AND ENTREPRENEURSHIP IN HEALTHCARE

**The Impact of Successful Founders and
How Decision Makers Can Support Them**

A REPORT BY:

endeavor
INSIGHT

WITH SUPPORT FROM:

The
Lemelson Foundation



ABOUT ENDEAVOR INSIGHT

Endeavor Insight is the research and policy division of Endeavor, a nonprofit organization with a 20-year history of supporting high-impact entrepreneurs around the world. Our team of economists, data scientists, and policy analysts provide data-backed insights on entrepreneurship and its contribution to economic development. We specialize in understanding how entrepreneurship networks can drive job creation and inclusive growth. We partner with organizations that support entrepreneurs, including foundations, multilateral agencies, and corporations.

ENDEAVOR INSIGHT STAFF

Leah D. Barto
Marine Fujisawa
Ana Paula Gil
Alejandro Noguez-Ibarra
Martin Pickering
Hamza Shad
Divya Titus

ADDITIONAL CONTRIBUTORS

Penmai Chongtouna
Jin Woo Chung
Rhett Morris
Lili Török

CONTACT

For more information about Endeavor Insight, contact Leah D. Barto at leah.barto@endeavor.org.

SPECIAL THANKS

The authors of this report would like to thank their colleagues at Endeavor including Derin Adebayo, Marc Cho, Luisa Fajardo, Adrián García-Aranyos, Patrick Linton, Opelo Matome, Fiona Mungai, Agostine Ndungu, Dustin Poh, Margaret Pollack, Linda Rottenberg, Sanjay Thapa, and Lian Vega.

We would like to express our thanks to Carol Dahl, Maggie Flanagan, Pam Kahl, and Rob Schneider of the Lemelson Foundation. The following individuals also provided valuable input as Endeavor Insight developed this report: Adenike Agbakosi, James W. Bair (Baraka Impact), Deepika Devadas (Grand Challenges Canada), Wilfred Njagi (Villgro Africa), Dinah Njuguna, Eloho Omame, Taslimarif Saiyed (C-CAMP), Audrey Selian (Baraka Impact), Precious Stephens, and Wendy Taylor.

Finally, we would like to thank Vishwaprasad Alva (Skanray Technologies); Namita Banka and Sanjay Banka (Banka BioLoo); Pratik Bhalerao (DeeDee Labs); Enbasekar Dinadayalane and Satish Kannan (MediBuddy); Abasi Ene-Obong (54gene); Sumona Karjee Mishra (Prantae Solutions); Olivia Koburongo (MamaOpe Medicals); Femi Kuti (Reliance Health); Adegoke Olubusi (Helium Health); and Kees Van Lede (CarePay).



**THIS RESEARCH WAS MADE POSSIBLE BY FUNDING FROM
THE LEMELSON FOUNDATION.**

Based in Portland, **The Lemelson Foundation** uses the power of invention to improve lives. Inspired by the belief that invention can solve many of the biggest economic and social challenges of our time, the Foundation helps the next generation of inventors and invention-based businesses to flourish.

The Lemelson Foundation was established in the early 1990s by prolific inventor Jerome Lemelson and his wife Dorothy. To date the Foundation has made grants totaling more than \$290 million in support of its mission.

Executive Summary

Endeavor Insight partnered with the Lemelson Foundation to understand how entrepreneurial healthcare companies can maximize their impact in developing countries. The purpose of the study is to provide a data-backed assessment of the challenges and opportunities facing entrepreneurs in this sector, and how best to support them.

The results offer guidance for decision makers who support entrepreneurs as they address the challenge of enhancing access to health services through improved and affordable preventive measures, diagnostics, and treatments. This study builds on recent research in the international development and social investment communities, and takes into account the impacts of the COVID-19 crisis, which has brought the sector to the fore.

Context and Opportunity

There is an urgent need for healthcare improvements across sub-Saharan Africa and India, and innovative companies are providing solutions. Improved access to health services is a key branch of the UN's Sustainable Development Goals (SDGs), and it is essential for achieving better health outcomes. Improving access is a particular challenge in low-resource settings and remote locations. Global health has become a more urgent priority since the onset of COVID-19, which has affected access and outcomes for maternal and infant health, childhood immunization programs, communicable and non-communicable diseases, as well as slowing progress in providing clean water and sanitation.

Entrepreneurs are driving advancements in the sector by improving the accessibility and affordability of healthcare solutions and technology. Innovative entrepreneurial companies are developing market-specific solutions to pressing needs. To understand the challenges and opportunities for entrepreneurs within the sector, this report primarily considers two types of companies:

- **Invention-based enterprises (IBEs)** are companies that conduct research and development and manufacture at least one component that is a physical product in which the innovation is unique enough to be patentable.

- **Service companies** are businesses whose primary innovation is not a physical product, including business process innovators and software companies. These companies are commonly involved in facilitating the service provision of healthcare providers.

Pathways to Success

Pathways for achieving scale and impact are different for IBEs in comparison to service companies. IBE founders are particularly strong in specialized technical knowledge, while service company founders have comparatively more experience in business and management. Endeavor Insight analyzed the pathways that founders and founding teams took, including their educational attainment, work and geographic experience, company types, and growth strategies. Researching patterns in these journeys is beneficial for decision makers to understand how to best support entrepreneurs, especially in the context of COVID-19.

Entrepreneurial Challenges

Founders face several challenges on the road to success. **Market entry** is a major challenge for early-stage healthcare companies, as the sector requires companies to succeed in clinical trials where necessary, receive approval from

regulators, and attract initial customers. As a heavily regulated industry, healthcare is strongly influenced by government policies.

Access to capital was the highest ranked challenge for founders in Endeavor Insight's dataset. There is a scarcity of both patient capital and local capital, but grants have proven to be instrumental in helping companies develop their products. Technical and managerial **talent** are both challenges for healthcare companies to recruit.

Support Ecosystems

Support organizations provide many benefits to healthcare companies. Participation in a support program can help to establish credibility, particularly with investors and B2B customers. Many programs provide access to laboratory facilities and equipment, providing a crucial benefit for those IBE founders that are not affiliated with a university. Founders consider support programs to be more helpful when they provide tailored coaching rather than generic advice or classroom-style talks. This level of service is limited by the low level of specialized mentorship in the healthcare sector.

India's ecosystem of entrepreneurial healthcare companies offers several lessons for supporting innovative solutions in developing markets. Specifically, cooperation among government bodies, research universities, angel investors, and even foreign actors bolsters a country's capacity for innovation and helps mitigate many of the challenges that founders otherwise typically face on their journeys.

Recommendations

This report provides five practical recommendations for addressing the major challenges that healthcare founders face, with actionable guidance for entrepreneurs, investors, support organizations, donors, policymakers, and universities.

1. Improve access to growth capital by aligning the goals of investors and healthcare entrepreneurs.
2. Enhance early-stage support and funding opportunities for healthcare IBEs.
3. Tailor support programs to the needs of the healthcare sector.
4. Prioritize mentorship from local actors with relevant experience.
5. Foster an enabling environment for entrepreneurship by building long-term innovation capacity.

Through these principles, decision makers can empower innovative entrepreneurs in sub-Saharan Africa and India to grow their companies and enhance the quality of and access to healthcare.

Methodology

The findings in this study are based on data collected from 228 innovative healthcare companies operating in sub-Saharan Africa and India, as well as interviews with 47 of their founders.

In parallel to this study on healthcare, Endeavor Insight also conducted research on innovative agriculture and clean energy companies, which offer points of comparison. Data was collected on a total of nearly 1,800 investors, grantmakers, mentors, and support organizations, of which approximately half supported healthcare companies.

Endeavor Insight's research is rooted in understanding how successful entrepreneurial businesses grow, covering several areas of need including capital, talent acquisition, mentorship, and support programs. Data collection occurred before and during the COVID-19 pandemic, and follow-up research took place in early 2021.

There are clear opportunities for entrepreneurs to enhance access to healthcare and further the SDGs.

With a focus on sub-Saharan Africa and India, this research explores how decision makers can best support healthcare entrepreneurs as they grow their businesses. The dataset focused on entrepreneurial companies that have innovated in software, business processes, or physical inventions. By considering the type of innovation a company's business model focuses on, this study offers stakeholders a broader menu of interventions to support them.

Key Research Questions

The research process was guided by the following research questions.

- What are the key characteristics of high-performing healthcare companies, especially invention-based enterprises (IBEs)?
- How are healthcare companies contributing to the Sustainable Development Goals (SDGs)?
- What are the challenges faced by innovative healthcare entrepreneurs, and how do they overcome them?
- How are ecosystem actors such as investors, mentors, and support organizations helping entrepreneurs?
- How can decision makers better support healthcare entrepreneurs?

I. Context and Opportunity

There is an urgent need for healthcare improvements across sub-Saharan Africa and India, and innovative companies are providing solutions.

THE URGENT NEED FOR HEALTHCARE INNOVATIONS

Access to healthcare services is key to achieving better health outcomes, and both sub-Saharan Africa and India are poorly served in this respect, despite improvements this century. The UN's Universal Health Coverage Index (an indicator on a scale of 0 to 100) is the most comprehensive and internationally comparable metric used to measure access and coverage across a range of factors. These include access to good quality healthcare services, as well as to safe and effective essential medicines and vaccines in a manner that avoids financial hardship.¹ The index rose globally from 58 to 66 between 2010 and 2017. In sub-Saharan Africa, the index rose from 37 to 44, and in India from 44 to 55.² By comparison the major economies of the United States, Japan, and the EU were in the range of 80 to 90.³

Basic access to healthcare is required to achieve improvements in various health indicators, from infant mortality to disease prevalence. Access to health services is a particular challenge for low-resource

settings and remote locations, which continue to struggle with poor health outcomes. There are several reasons why these areas are relatively underserved. Inadequate physical and technological infrastructure, such as the lack of paved roads, electricity, and internet in rural areas, is a major limiting factor on the reach of healthcare companies. There are also limitations imposed by human capital issues, both in terms of insufficient numbers of trained personnel, as well as insufficient numbers of those willing to work in remote locations.

The sets of diseases and health issues that people face are also diverse and often geographically specific to each market, meaning that local understanding and tailored solutions are important for proper healthcare. This also means that the healthcare services that already exist in developed countries may not be suitable or affordable enough for other contexts.

Access to health services is a key branch of the UN's Sustainable Development Goals (SDGs), which provide a blueprint for the global community to address these issues. SDG #3 aims to "ensure healthy lives and improve well-being for all at all ages," and this goal can only be achieved with improved access. It is also important to consider various health outcomes individually to be able to assess progress towards this goal.

Global health has become a more urgent priority since the advent of COVID-19. Prior to the pandemic, there had been advances in many areas of healthcare in sub-Saharan Africa and India, but the rate of progress was not sufficient to meet most SDG #3



targets.⁴ The impact of COVID-19 has been so deep in all aspects of healthcare around the world that it is worth noting progress in the various health outcome indicators in the context of the pandemic.

The pandemic has led to many healthcare systems being overwhelmed, as well as people being unable or afraid to access health services. It has eroded health systems, disrupted routine medical care, and constrained access to nutritious diets and essential nutrition services. These disruptions have reversed prior improvements in many of the key areas under consideration, and they have different implications across regions due to the geographically specific challenges that exist.

Maternal and infant mortality are two of the leading indicators for global health, and despite recent progress, there remain stark differences between developed and emerging economies. Complications in pregnancy and childbirth are the leading cause of death among girls aged 15 to 19 globally, with low- and middle-income countries accounting for 99 percent of maternal deaths of women aged 15 to 49.⁵ The global maternal mortality ratio fell between 2000 and 2017, from 342 to 211 deaths per 100,000 live births worldwide, less than half the annual reduction needed to reach the target of 70 by 2030.⁶ The rate in sub-Saharan Africa fell from 635 to 542, and in India from 210 to 145.⁷ Under-five deaths paint a similar picture, with the rates falling from 76 to 39 deaths per 1,000 live births between 2000 and 2018 globally. Sub-Saharan Africa's rate fell from 152 to 79, and India's from 92 to 36.⁸

The UN's target is a rate of 12 by 2030, which currently appears out of reach, particularly given the disruptions caused by the pandemic. According to the UN, these led to hundreds of thousands of additional under-five deaths in 2020, as well as tens of thousands of maternal deaths.⁹

Family planning supplies and services are crucial to improving these statistics. An estimated 218 million women in developing economies are unable to access effective family planning, which affects both their health and opportunities for education and employment.¹⁰ Investment in family planning services also carries accrued economic benefits — for every dollar invested, there is an estimated \$120 return in annual benefits as a result of reduced infant and maternal mortality, and increased economic growth.¹¹ Skilled health professionals assisted 81 percent of all births globally from 2014 to 2019, a ratio that was as low as 60 percent in sub-Saharan Africa and 77 percent in southern Asia.¹² As sub-Saharan Africa is expected to see a 15 percent rise in births from 2019 to 2030, there may be even lower rates of births assisted by skilled professionals.

The availability of modern contraception is another indicator where sub-Saharan Africa lags the global average by a wide margin. According to UN data, the proportion of women aged 15 to 49 who have their need for family planning satisfied with modern contraceptives stood at 76.8 percent globally in 2020, compared to only 55.5 percent in sub-Saharan Africa.¹³

Immunization is one of the most successful and cost-effective health interventions in limiting the spread of infectious diseases. However, the COVID-19 pandemic interrupted childhood immunization programs in 70 countries in 2020, storing up substantial future health problems.¹⁴ Measles and polio vaccination programs were particularly badly hit, with measles campaigns suspended in 27 countries and polio campaigns suspended in 38 countries in 2020. Prior to COVID-19, progress on some of the most important vaccines had been positive. Between 2010 and 2019, the proportion of people with access to the diphtheria-tetanus-pertussis (DTP3) vaccine rose from 79 percent to 91 percent in India, and from 70 percent to 73 percent in sub-Saharan Africa.¹⁵ India started to introduce a two-dose measles vaccine in districts where rates of single-dose vaccination were low in 2010, and the campaign is estimated to have saved tens of thousands of lives.¹⁶ Between 2010 and 2019, the proportion of the target Indian population with access to a second-dose measles vaccine rose from zero to 84 percent. Over the same period, the proportion of targeted people in sub-Saharan Africa with access to the second-dose measles vaccine rose from 2 percent to 31 percent.¹⁷

People with pre-existing **non-communicable diseases** are more vulnerable to becoming severely ill with the coronavirus. In addition, prevention and treatment services for these diseases — the main ones monitored are cardiovascular disease, cancer, diabetes and chronic respiratory disease — have been severely disrupted by the pandemic, with low-income countries most affected.¹⁸ The primary obstacle to reducing the impact of these diseases is an overall shortage of services to prevent and treat, which correlates broadly with access to healthcare indicators.

The COVID-19 related service disruptions have also had a huge impact on **communicable diseases**, with the UN estimating that it could lead to hundreds of thousands more deaths from malaria, AIDS, tuberculosis, and tropical diseases such as dengue.¹⁹ Service cancellations brought an estimated 100 percent rise in malaria deaths in sub-Saharan Africa alone in 2020. Globally, advances in reducing the incidence of HIV started to stall in 2015, though new cases in sub-Saharan Africa — which accounted for 61 percent of global infections in 2018 — continued to fall, at least until the pandemic struck.

Despite progress, billions of people across the globe also still lack the basic services of **clean water and sanitation**, and this deprivation contributes to the spread of disease and poor health outcomes. The pandemic has brought to the fore the importance of water, sanitation, and hygiene to prevent infection and slow the spread of COVID-19 as well as other diseases. In 2016, the mortality rate per 100,000 people attributed to unsafe water, unsafe sanitation, and lack of hygiene stood at 18.8 in India and 48.2 in Africa, compared to less than 0.5 in western Europe.

Typhoid remains a serious problem in India, particularly in low-resource urban settings. Nationwide data is scarce, but studies in urban slums have suggested that the annual incidence of typhoid is as high as 5 cases per 1,000 children under the age of 10 in such settings.²⁰ The absence of nationwide surveys has minimized the effective prevention and control of such water- and food-borne diseases, but poor sanitation levels — exposed by COVID-19 — continue to exert a burden on enteric fevers such as typhoid.

Rapid growth in global health financing this century has resulted in significant improvements to health outcomes, with

governments and donors at the forefront. However, more must be done to address the issues described above and to meet the SDGs. The funding landscape has shifted markedly in the past few decades. The leading source of capital flows from the United States to developing countries, for example, has changed from aid to investment.²¹ In tandem with this there are new trends in development finance. Traditional donors are supplementing grant-based financing with new forms of conditional and catalytic support, and private investments are increasingly targeting and generating social impact. This means that donors, governments,

and philanthropies are involved in a more diverse landscape, advancing a more inclusive development agenda.²²

Without sufficient progress towards universal access to healthcare, improvements in health preparedness, and affordable diagnostics and treatments, the human and economic costs will be devastating. The UN estimates that 90 million people were pushed into extreme poverty by out-of-pocket health payments in 2015, and the income loss from COVID-19 will have worsened the crisis.



OPPORTUNITIES FOR ENTREPRENEURSHIP

Entrepreneurs are driving advancements in the sector by improving the accessibility and affordability of healthcare solutions and technology. Innovative entrepreneurial companies are addressing the SDG targets and developing market-specific solutions to pressing needs, especially in the context of the COVID-19 pandemic. To understand the challenges and opportunities for entrepreneurs within the sector, it is useful to categorize companies by innovation type.

Invention-based enterprises (IBEs) are companies that conduct research and development (R&D) and manufacture at least one component that is a physical product in which the innovation is unique enough to be patentable. IBEs comprise almost half (110 out of 228) of the companies in this study and are developing new products that are tailored to the needs of the health sector for diagnosis, treatment, and facilitating access to healthcare.

IBEs, in providing physical solutions with transformative impact, are qualitatively different from the other innovation types. These include drug and vaccine developers, as well as those developing innovative tools and devices for diagnostics and treatment. IBEs broadly correspond to “science-led innovators”, as defined by USAID.^{*,23}

Diagnostic and monitoring devices tailored for low-resource settings comprise a particularly prominent focus area for healthcare IBEs. Uganda-based **MamaOpe Medicals** has produced an easy-to-use diagnostic device that uses acoustic technology to detect signs of respiratory disease. Other healthcare IBEs are inventing cutting-edge treatment devices and tools. For example, India’s **DeeDee Labs** has built a next-generation, multi-articulating prosthetic hand using muscle electrical signals or biosignals.

Service companies, whose primary innovation is not a physical product,

encompass business process innovators (companies that have primary activities delivering a product or service that require “on-the-ground” operations, but may involve the use of technology) and software companies (which have primary activities in developing and selling in technological solutions and platforms, such as fintech or e-commerce). These companies are commonly involved in facilitating the service provision of healthcare providers, allowing for improved communication between providers, specialists, patients, and manufacturers, or providing web-based diagnostic tools.

Service companies encompass three of USAID’s categories of innovation type: service delivery innovators, digital health innovators, and health finance innovators.²⁴

Service delivery innovators assist in the provision of care to patients and to ancillary operations for providers. Most business process companies correspond to this category, as well as some software companies. Examples include India’s **DocsApp** (now **MediBuddy** after a 2020 merger), which is a digital platform that improves access to doctors for consultations, facilitates blood tests, and offers a medicine delivery service; and Nigeria’s **Helium Health**, which provides digitized healthcare services such as electronic medical records, hospital management and insurance, credit, and billing.

Digital health innovators deliver solutions for patients, providers, and systems. Digital platforms and telehealth are making important advancements to facilitate healthcare access and to strengthen supply chains. These are mostly software companies that provide online diagnostics, connections with healthcare professionals, or e-commerce services. Examples include Kenya’s **Baobab Circle**, which has developed the Afya Pap app

* Other frameworks may also be applicable. For example, many healthcare IBEs could also be considered “high-growth ventures” according to the segmentation from Dalberg’s “The Missing Middle” report. See frontierfinance.org/missing-middle.

to help users manage chronic illnesses; and India's **Beato**, which has developed a diabetes care and management app.

Health finance innovators are mostly software companies that offer insurance and medical loans. Examples include Nigeria's **Reliance Health**, a tech-driven health insurance company, and India's **LetsMD**, a healthcare portal that offers medical loans and financial assistance for treatments.

Despite their different business models, both IBEs and service companies have the potential for innovation. Nearly 30 percent of the companies in this study have filed for or received at least one patent, a rate that is comparable for both IBEs and service companies.

In addition to operating in these different subsectors within the healthcare sector, companies serve different sets of customers. The businesses and models face different challenges depending on whether they are serving individuals as business to consumer (B2C) companies, public bodies, institutions, or public healthcare providers as business to government (B2G) companies, or those within the healthcare supply chain as business to business (B2B) operations.

EXAMPLES OF HEALTHCARE COMPANIES BY INNOVATION TYPE

The headquarter country and year founded are indicated in parentheses.

Invention-Based Enterprises (110)



DeeDee Labs
(India, 2016)

*designs next-generation
prosthetics devices*



Matibabu
(Uganda, 2015)

*provides cost-effective, rapid,
and early diagnosis of malaria*



Banka BioLoo
(India, 2012)

*makes toilets with biodigester
technology for end-to-end waste
management in remote areas*

Service Companies (118)



54gene
(Nigeria, 2019)

*curates genetic and clinical data
to aid treatments and diagnostics*



Beato
(India, 2015)

*offers a diabetes care and
management app*



CarePay
(Kenya, 2014)

*provides an app-based health
payments platform*

II. Pathways to Success

Pathways for achieving scale and impact are different for IBEs in comparison to service companies.

In order to understand the factors that contribute to the success of entrepreneurs within the healthcare sector, Endeavor Insight analyzed the pathways that founders and founding teams took, including their educational attainment, work and geographic experience, company types, and growth strategies. Researching patterns in these journeys is beneficial for decision makers to understand how to best support entrepreneurs, especially in the context of COVID-19. This section separates companies by innovation type to highlight the differences in their business models

and trajectories for achieving scale and impact. At the same time, some companies also blur the line between these categories.

Endeavor Insight considered several metrics of success for this analysis to characterize scale and impact. These include employee size, capital raised, number of customers or users, and international expansion. Although they measure different aspects of a business's growth, these figures tend to be positively correlated with each other, as more personnel and capital are needed to expand to new geographies and customers.

FOUNDER BACKGROUNDS

Founders of innovative healthcare companies share certain qualities, including intention for impact and significant educational and professional experience. Interviewed founders expressed a strong aspiration to improve the quality of life, halt preventable deaths, and increase the reach, affordability, and quality of healthcare — especially for rural and other underserved populations. Several founders had personally felt the consequences of poor access to healthcare in their circle of family and friends, making impact a prime motivating factor for many.

Overcoming geographic and developmental constraints was another motivating factor. Many entrepreneurs noted the difficulty of access to testing and other aspects of healthcare outside large cities in sub-Saharan Africa and India, so they started their companies to make those services and technologies available and usable in rural, low-resource settings. Many

local founders also noted the mismatch between imported solutions and local needs, which inspired them to take action.

Entrepreneurs in this sector are highly educated, and most are new to entrepreneurship. Many founders previously worked as physicians, pharmacists, engineers, or scientists, while others had professional experience in the tech sector. A majority — 64 percent — of healthcare founders held a master's degree or PhD, with PhDs more common among these founders than in the clean energy or agriculture sectors.

Related work experience is less of a factor for healthcare entrepreneurs, with only 25 percent of healthcare founders having previously worked at one of the world's 1,000 largest public firms, while 16 percent had worked at another health company. Only 4 percent had previous entrepreneurial experience.



INVENTION-BASED ENTERPRISES

Founders of healthcare IBEs are developing new technologies to diagnose and fight illness, and designing more efficient and appropriate devices for their local markets. Many of these IBEs are producing testing and diagnostic devices, including ones through which users can self-monitor their health. IBEs comprise many of the youngest entrepreneurial companies in healthcare, introducing new technologies such as 3D-printed products and gene testing.

IBEs based in developing countries seek to produce more appropriate solutions for their contexts than imported solutions, as the latter are often more costly or not suited to the particular needs of these countries. One founder spoke of how even though material costs may be the same for him to purchase, engineering and material processing/handling costs are lower than in developed markets, allowing his company to produce more affordable products. For example, the Indian company **Aakar Innovations** invented a machine that produces sanitary pads from raw materials that are local to the country and are compostable, demonstrating the value of local solutions.

The founders of IBEs often have specialized technical knowledge. A substantial majority — 86 percent — of IBE founders in Endeavor Insight's dataset have completed a degree in a STEM (science, technology, engineering and mathematics) subject, compared to 77 percent of service company founders. Similarly, 21 percent of IBE founders have a PhD, compared to 9 percent of service company founders.

In terms of experience, IBE founders also have a greater grounding in STEM-related disciplines, with 71 percent having work experience in those areas, compared to 57 percent of service company founders. Some IBE founders cited their lack of business experience

as a challenge for registering their firms, managing IP protections, understanding other regulations, and fundraising.

IBE products were often developed as projects at universities in India or the United States. Prominent among these are the Indian Institutes of Technology (IITs), a group of 23 autonomous public technical universities. For product development, IBEs require specialized equipment and lab facilities, so affiliation with research institutions such as the IITs is beneficial and common, with many entrepreneurs having taken advantage of such facilities. Those without such access therefore face further hurdles, with one entrepreneur reporting having to bootstrap to build a laboratory first, before being able to work on the product and then found the company.

Research and development (R&D) is vital for IBEs. In interviews, founders described the positive role of conducting in-house R&D for their companies, as it was crucial for the iterative process of identifying customer needs and developing or validating practical solutions. During trials, founders iterated product design based on user feedback, meaning that access to appropriate facilities is vital.

The process of product development, prototyping, and iteration is timely and costly, and Endeavor Insight's research has shown that IBEs have longer development timelines than other types of innovative companies. (See Appendix on p. 44.) IBEs must receive permission from hospitals to conduct pilot trials, in addition to government certifications and approval to go to market. IBEs also have different priorities for capital, especially in the early stages, than service companies. Whereas service companies can use capital to hire qualified managers and fund expansion, IBEs first use capital

for R&D and hiring technical talent, which also contributes to the difference in their development timelines.

The **COVID-19** pandemic disrupted supply chains for input materials for IBEs, which has contributed to concerns that heavy dependence on just one country for materials, China, can create bottlenecks in production. Some IBEs were also able to redirect their existing production capacities to introduce pandemic-related solutions. **Neopenda**, a company based in the United States and Uganda, modified its neoGuard wearable monitor

and accelerated development so that it could be used for both adult and pediatric patients affected by the coronavirus. The device, which measures pulse, respiratory rate, peripheral blood oxygen saturation, and temperature, can be used both in hospitals and remotely to monitor patients who are recovering from COVID-19 at home.²⁵ India's **Trivitrion Healthcare**, which manufactures diagnostics devices, pivoted to begin manufacturing of COVID-19 testing kits, ventilators, and personal protective equipment in response to the pandemic.²⁶





CASE STUDY:

Skanray Technologies

Producing a variety of medical devices, Skanray Technologies has a large R&D team and has expanded beyond India to serve global markets.²⁷

Vishwaprasad Alva (*below*) led a team of medical device engineers and professionals to launch Skanray Technologies in 2007. Prior to returning to India to start the company, Alva had spent close to 10 years working for General Electric, in India and then the United States. All five of the team had backgrounds in R&D, so the company started as an engineering R&D company. They initially had a focus on x-ray machines, working for 18 months out of an incubation center before they reached the prototype phase and moved to a new facility. As with many IBEs, Skanray focused on R&D in its early years, before the company launched commercially in 2011.²⁸

The x-ray market is highly competitive in the low- to mid-price range that Skanray joined (German companies dominate the higher end of the market), so the company focused on innovation to gain an edge. Skanray used modern technology to simplify the designs of products and gained a design edge over products from most of the large existing hardware companies, which were 15 or more years old in terms of design.²⁹ The

company's use of advanced technology enabled them to develop products for the global market, which could also be sold in India. Skanray's focus on innovative design has led to filing over 80 patents and design and trademark

registrations spanning radiology, monitoring, anesthesia delivery systems, and critical care products such as ventilators. Some of their products, such as the Skanmobile X-Ray machine and Skan-Respiro ventilator, are portable, enabling use outside of traditional healthcare facilities.

Regulations — and uneven compliance from competitors — were a challenge that Skanray worked hard to overcome. Their first product was a dental x-ray device with the lowest x-ray radiation leakage globally. But other Indian manufacturers did not comply with strict radiation norms, leaving Skanray at a competitive disadvantage to sell a compliant product. The company took two years working with hospitals and the government to strengthen compliance in the market, which improved Skanray's standing relative to its competitors and justified its focus on design quality.

The regulatory battles led the company to pivot and broaden its horizons by also making devices for global markets with stable regulatory environments. Skanray focused on becoming an original equipment manufacturer (OEM) to multinational corporations, exporting to about 80 countries and, in the process, became India's largest medical device exporter and largest med-tech company. The company became successful in India only after becoming successful as an OEM and as an exporter.

There remains a focus on innovative design, and the company has even expanded its research efforts internationally. Although



there are a lot of engineers in India with mechanical engineering experience, the country lacks product designers, so the company had to build those capabilities. They have done so by forming a 350-person strong R&D team in India and a second R&D team in Bologna, Italy.

The company has made several acquisitions within and beyond India. One was the 2013 acquisition of L&T, a long-standing medical equipment and services company, which helped Skanray to gain a marketing network. By 2019, Skanray had revenues of around \$30 million, and had 100,000 installed machines worldwide, with over 10,000 customers.

In 2020, as the COVID-19 pandemic struck, Skanray was at the forefront of efforts to increase India's supply of ventilators. Before the pandemic, India had around 11,000 operational ventilators, and in mid-year the government estimated the need for an additional 100,000, with Skanray winning the largest order, of 30,000. This led the company to ramp up its production capacity from 200 ventilators per month pre-COVID to 5,000 per month, and then to 100,000 per month.³⁰ The company did so by announcing that it would share the intellectual property and design with whichever manufacturer could scale up the production. They partnered with two other

Indian companies, Mahindra and Bharat Electronics Limited (BEL). After agreeing to the deal with Mahindra, Alva says, "the first units rolled out of the Mahindra facility in less than three weeks. In normal times, this would have been a six-month exercise."³¹

With BEL, Alva adds, "We transferred the manufacturing technology and the test set-up to BEL to be able to scale up from a stretched capacity of 5,000 per batch to a capacity of 30,000 units to be delivered in 8 to 12 weeks. All the 30,000 units ordered by the government to BEL-Skanray would be delivered before the middle of August." Skanray maintained design ownership, with BEL responsible for manufacturing.³²



SERVICE COMPANIES

Healthcare service company founders are driven by a desire to fill gaps in the accessibility and affordability of healthcare services. These companies improve efficiency in supply chains, reduce costs, and make use of partnerships with existing institutions such as pharmacies and hospitals. As one founder noted, a major cause of poor health outcomes is less a lack of technology than poor access to it. As a result, his company focuses on leveraging existing technology from more developed markets. Nigeria's **54gene**, a health technology platform company, has also applied innovative technology within emerging market economies and communities. It combats global health inequalities by addressing the existing shortage of genetic data for Africans and providing them with precision medical care.

Service companies include those that innovate primarily with software-focused solutions, with many of these seeking to formalize financing systems for patient care to reduce their reliance on informal networks of family and friends. Other digital health innovators are digitizing and streamlining processes for patient records, insurance claims, and other paperwork. This creates better connections between providers, patients, and insurers. Service companies often cover more mature subsectors than IBEs, such as lab testing services, ambulance services, and anti-counterfeit software.

As the graph on the next page shows, the founders of service companies are, on average, more experienced in business and management than those of IBEs, with 66 percent of service company founders having C-suite or other management experience, compared to 58 percent of IBE

founders. Some specific business skills and experience are also more common among service company founders, 16 percent of whom have finance or accounting experience, compared to 9 percent of IBE founders. Similarly, 23 percent of service company founders have marketing, sales, or business development experience, compared to 9 percent of IBE founders. In terms of education, 44 percent of service company founders hold a business degree, compared to only 17 percent of IBE founders.

Within the service companies grouping, there are some notable differences between business process companies and software firms. Business process companies are, on average, the oldest firms in the sector, while software companies are the youngest, due to the recent uptake of mobile usage in developing countries. Business process companies are also much larger, with an average of 181 employees, compared to 66 for IBEs and 61 for software companies.

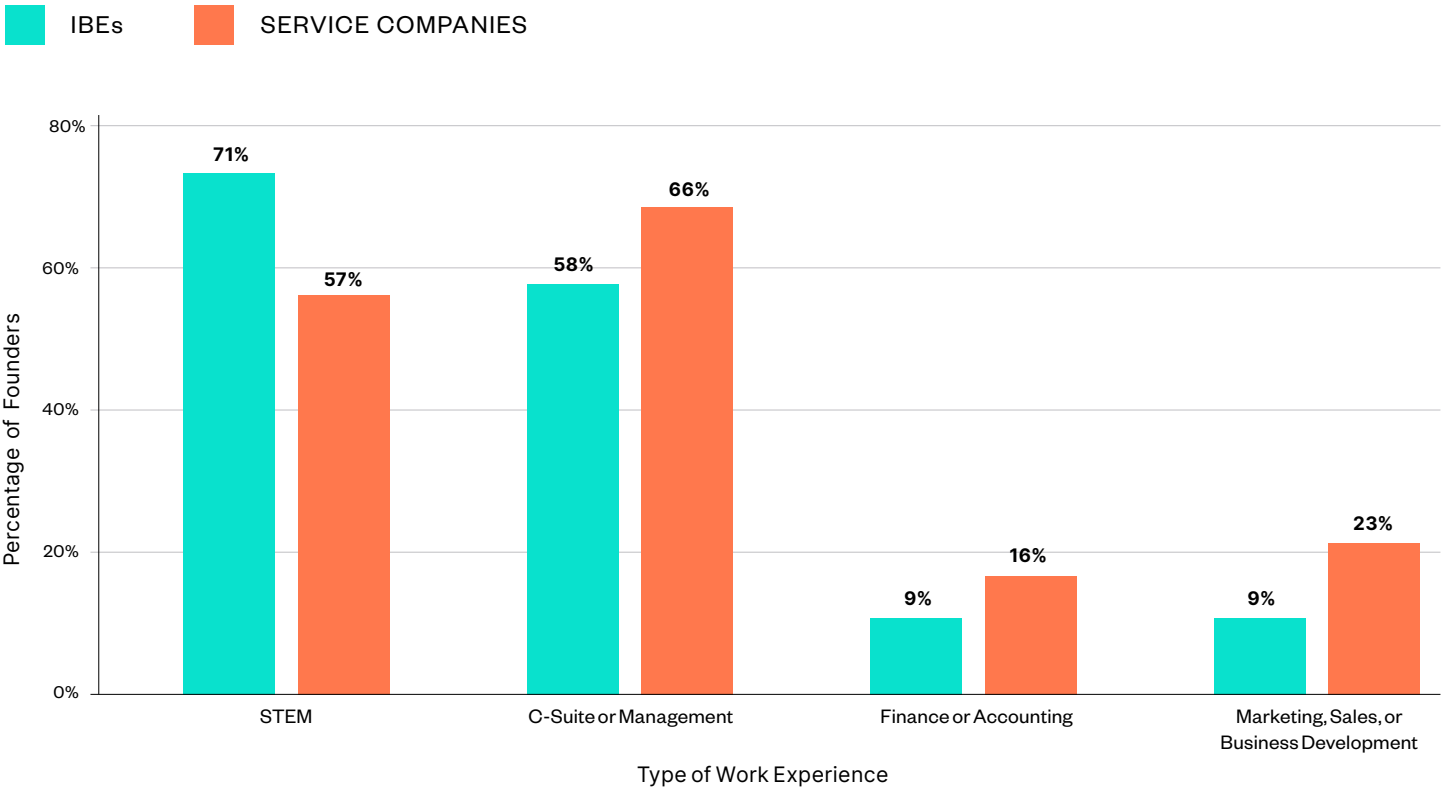
Despite the clear challenges that the **COVID-19** pandemic brought, some service companies seized opportunities. For example, the pandemic has accelerated the adoption of telemedicine in both developed and developing countries. India's **DocsApp** (now **MediBuddy** after a 2020 merger) partnered with Google Pay to offer online consultations during the second wave of COVID-19 in the country in the first half of 2021.³³

As a result of travel restrictions, more technically-trained local professionals stayed in sub-Saharan Africa rather than moving abroad for work in 2020 and 2021, as noted by the founder of Nigeria's **Helium Health**. (See Case Study on pp. 20-21.)

Consequently, the company was able to strengthen its technical capacity. The company primarily focuses on digitizing data and enabling telemedicine for healthcare systems in Africa, but also entered the public health sphere at the start of the pandemic, becoming the official partner of the Nigerian government for COVID-19 response. Helium Health built the country's emergency response technology, and also provided the country's vaccine monitoring and track and trace software.³⁴

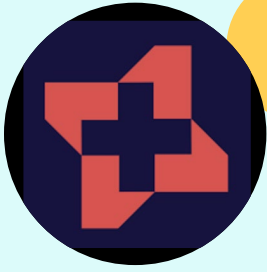
Another Nigerian company, 54gene, converted its DNA biobank lab into the first accredited private COVID-19 testing center in Nigeria, and also converted shipping containers into mobile testing laboratories.³⁵

COMPARISON OF HEALTHCARE FOUNDER WORK EXPERIENCE BY INNOVATION TYPE



Note: Figures represent the percentage of founders of healthcare firms who possessed each type of work experience prior to founding their company. STEM experience encompasses work in scientific, technical, engineering, and mathematical roles. C-Suite or Management Experience refers to previous employment in an executive or managerial role. Finance or Accounting Experience encompasses work in finance or accounting roles. Marketing, Sales, or Business Development Experience refers to previous employment in marketing, sales, or business development. Categories are not mutually exclusive.

Sources: Endeavor Insight interviews and analysis; LinkedIn; PitchBook; Crunchbase; company websites. Sample size: 405 founders.

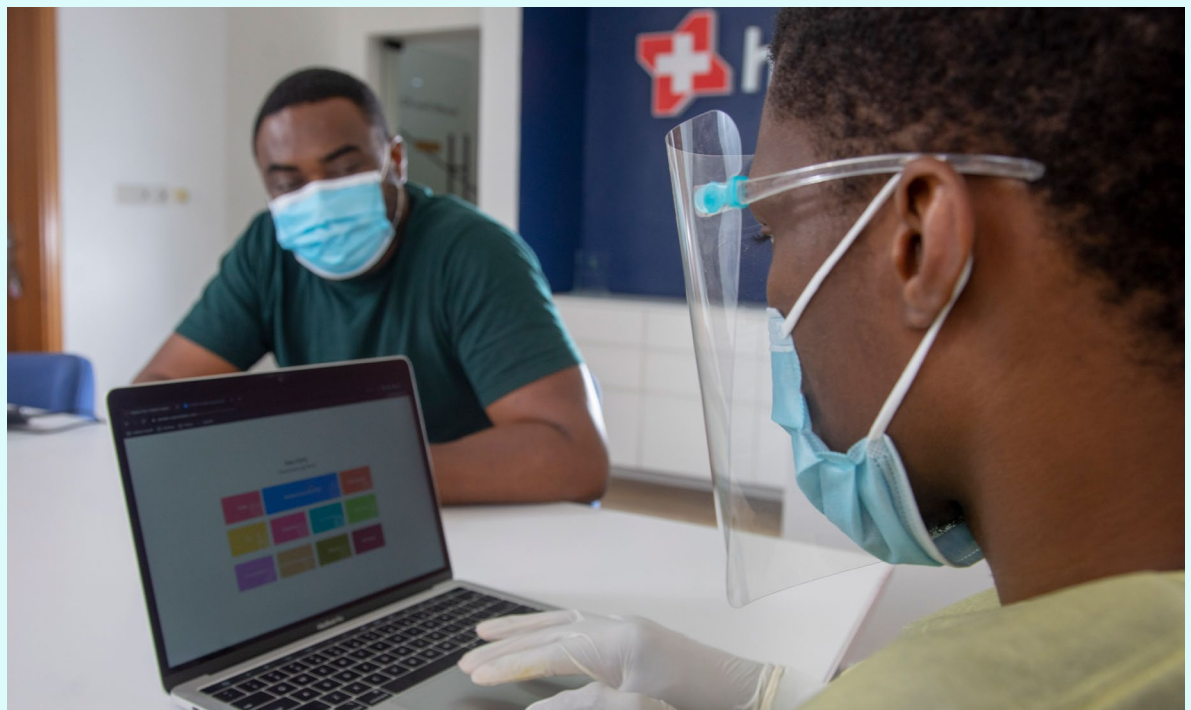


CASE STUDY: Helium Health

Nigeria's Helium Health is streamlining healthcare systems across Africa through the digitization of medical records and financial services.³⁶

Adegoke Olubusi, Dimeji Sofowora, and Tito Ovia founded Helium Health in 2016 with the aim of creating a single digital structure across the Nigerian healthcare system. The three co-founders, who are Nigerian returnees, brought together diverse work experience, including positions at large multinationals such as eBay and Dell, as well as in the public health sector. Their experiences studying and learning abroad were beneficial, in terms of knowledge, contacts, and building their professional reputations. Olubusi explains, "I don't think it would have been as easy for people to trust and respect me if I didn't have the Western education, if I didn't go to John Hopkins. It would have been practically impossible for me to start this company if I didn't have those networks and that privilege."

The founders had seen the fragmentation of the Nigerian healthcare sector and sought to use technology to make life easier for all stakeholders in the system. According to Olubusi, "We started to take our clients digital — hospitals, clinics, and other health facilities — using our flagship Electronic Medical Records/Hospital Management Information System (EMR/HMIS) product. We started with top and middle tier hospitals because those have the least friction for us getting in. It is likely they already have computers, and after that we can afford to support less resourced facilities." The company has expanded its offering to a suite of technologies, supporting providers and patients, and delivering to clients the data needed to improve links within countries and across borders.



Helium Health closed its most recent Series A round in 2020. They used this financing to scale three different aspects of the business. The first was to invest more in their core technology, to expand the reach of their EMR/HMIS. They also launched two financial service products: HeliumPay and HeliumCredit. As Olubusi explains, this has enabled “us to use our tech to manage billing and revenue cycle management for facilities within our network, for the government, and also to start lending to facilities with our HeliumCredit program.”

The company has launched internationally in Kenya, Uganda, and Cameroon, adding a further 150 facilities to its network across its countries of operation. By June 2021 HeliumPay had processed \$25 million of payments, and HeliumCredit had loaned \$1.5 million to healthcare facilities for working capital and asset financing. With urban centers providing a solid financial base for Helium Health, the company has also started to work with local governments in rural areas to collaborate in building sustainable models for more remote healthcare facilities.

Helium Health’s core offering remains that of digitizing data and enabling telemedicine for healthcare systems, but the company also feels a responsibility towards strengthening the overall healthcare market. “A big part that we have to play is in educating the market based on the insights that we now have,” says Olubusi. “We’ve published lots of reports, because there’s not enough validated data on healthcare in the market, and we share insights, because it’s from the base of those insights that entrepreneurs and people build companies.” The founders have also mentored smaller healthcare companies to help them commercialize their solutions and help them approach healthcare from a private sector perspective.



*Tito Ovia,
co-founder*



*Dimeji Sofowora,
co-founder*



*Adegoke Olubusi,
co-founder*

III. Entrepreneurial Challenges

Founders face several challenges on the road to success.

ENTERING THE MARKET

Market entry is a major challenge for early-stage healthcare companies, as the sector requires companies to succeed in clinical trials, where necessary, receive approval from government regulators, as well as attract initial customers. These elements affect the underlying business model and viability of companies, presenting challenges to attracting funds if they are seeking to grow through investment. Successful healthcare founders develop detailed strategies for going to market, from product development to customer acquisition.

As a heavily regulated industry, healthcare is strongly influenced — both positively and negatively — by government policies. Healthcare companies, particularly IBEs which produce new devices and treatments, need to obtain regulatory clearances and certifications for pilots, trials, and public release. For some newer types of healthtech, founders face uncertain regulatory environments because the speed of technological advancement has often outpaced the development of norms or policies. Companies that seek to expand internationally require regulatory approval from each government, though some clearances — such as from the U.S. Food & Drug Administration — are recognized by multiple countries.

The uneven enforcement of laws due to low capacity or corruption can also create difficulties for entrepreneurs, as the experience of **Skanray Technologies** shows. (See Case Study on pp. 16-17.) The company complied with radiation safety requirements in India while competitors did not, even though

hospitals were aware of this issue. Over time, compliance has improved, but such examples are not uncommon.

According to interviewed founders, gaining the early trust of hospitals and doctors is crucial for success. This is especially important for B2B companies, such as service companies in the healthcare supply chain or IBEs supplying medical equipment, since hospitals are often their customers. Acceptance from hospitals and doctors is crucial for “proof of concept” and to show that the product is viable and legitimate. Their permission is also required in order to run clinical trials. Founders reported that they have to put in significant time to build trust, holding meetings, sharing information and receiving feedback to understand the medical community’s concerns. Live demonstrations have often proved beneficial in building trust. For B2C companies, such as those providing health apps for self-monitoring, some companies participated in public education campaigns to increase the knowledge and usage of their products.

Affordability is often an obstacle to gaining customers, particularly for the physical products of IBEs when they are intended for lower income populations. The lengthy and costly process of bringing such products to market often necessitates a high price, which may exclude the targeted population. As a result, government procurement and partnerships are often essential for product sales in this category. To mitigate this problem, successful companies also involve end users in the design process, to be sensitive to customer needs.



Some founders reported that their companies have not been able to grow in customer reach because their potential go-to-market partners are fragmented, meaning that they have to work with different local government and corporate partners in each region. This is especially challenging across countries, and consequently only 16 percent of

the studied healthcare companies have expanded internationally. OECD-based companies were more likely to have expanded internationally, as were expat-led companies based in India and sub-Saharan Africa. Indeed, 46 percent of expat-led companies expanded internationally, compared to only 10 percent of returnee-led and 6 percent of all-local companies.

EARLY-STAGE HEALTHCARE IBEs

Up-and-coming founders in healthcare are designing unique, context-specific devices that, while still in early stages, have high potential to reach scale.

There are many IBEs in sub-Saharan Africa and India that are still in the pre-revenue or early stages. Many have spent time conducting R&D, iterating design, and gaining regulatory approval, but they have not yet gone to market or have only recently done so. These companies share some commonalities that provide an insight into early-stage challenges for firms seeking to launch innovative products in heavily regulated markets.

Prantae Solutions was founded in 2015 by Sumona Karjee Mishra and Aseem Mishra (*below*) with the aim of producing low-cost diagnostic tools for early disease detection. The couple, highly qualified with PhDs in virology and microbiology, first developed two simple and affordable devices to help in the early diagnosis of preeclampsia, a rare condition that is only symptomatic in the last trimester of pregnancy. The pair realized that the biomarkers identified by their devices could also be used to diagnose other disorders such as kidney diseases.

As with many IBEs, the development timeline is long. Speaking in 2018, Sumona recounted how three years after launching, the company was still conducting R&D, with an aim of seeing their diagnostics “in the field within the next three or four years.”³⁷ Grants and patient capital have been fundamental to supporting the company during this time. Within a year of founding Prantae

Solutions, “I got a grant from Tata,” says Sumona. “The next year I got a grant from MSME [the Indian Ministry of Micro, Small, and Medium Enterprises], then several others. We’ve had so much support, not only financially, but also because they are motivating us to do something that we believe in. Startup Odisha and Startup India have also helped us so much.”³⁸

The company has started to target other chronic disorders through its technology, including new diagnostic methods for rheumatoid arthritis. This technology aims to replace diagnostics with something more sensitive and deployable to resource-limited point-of-care settings. In June 2021, Prantae was selected to participate in a joint initiative by the Indian government and the Foundation for Assistance to Small Innovative Enterprises (FASIE), a non-commercial Russian state body, to develop a platform technology in partnership with Russia’s Aivok LLC for this diagnostic tool.³⁹ Prantae has also developed two products for COVID-19 diagnosis and a self-monitoring device for kidney health status, which is entering production while clinical trials are ongoing.

MamaOpe Medicals was started in Uganda in 2017 by three local engineers, Olivia Koburongo, Besufekad Shifferaw, and Brian Turyabagye. The company has developed a biomedical device designed to diagnose pneumonia faster and more accurately than a doctor. After bootstrapping initially, MamaOpe won prize money for placing second in the University of California, Berkeley’s Big Ideas competition in the global health category.⁴⁰ After this success, the company received more grants and investment support from various support organizations.



In 2018, MamaOpe developed a proof-of-concept prototype and partnered with Villgro Africa. Villgro connected the company to CAMTech Uganda, a medtech accelerator based at the Mbarara University of Science & Technology, which gave it access to lab facilities and technical assistance. Device verification and safety simulations followed, and in 2020 MamaOpe moved into industrial design and alpha prototype development. The founders plan to launch MamaOpe in Uganda by 2023, scale into East Africa by 2025, and expand across Africa by 2030.

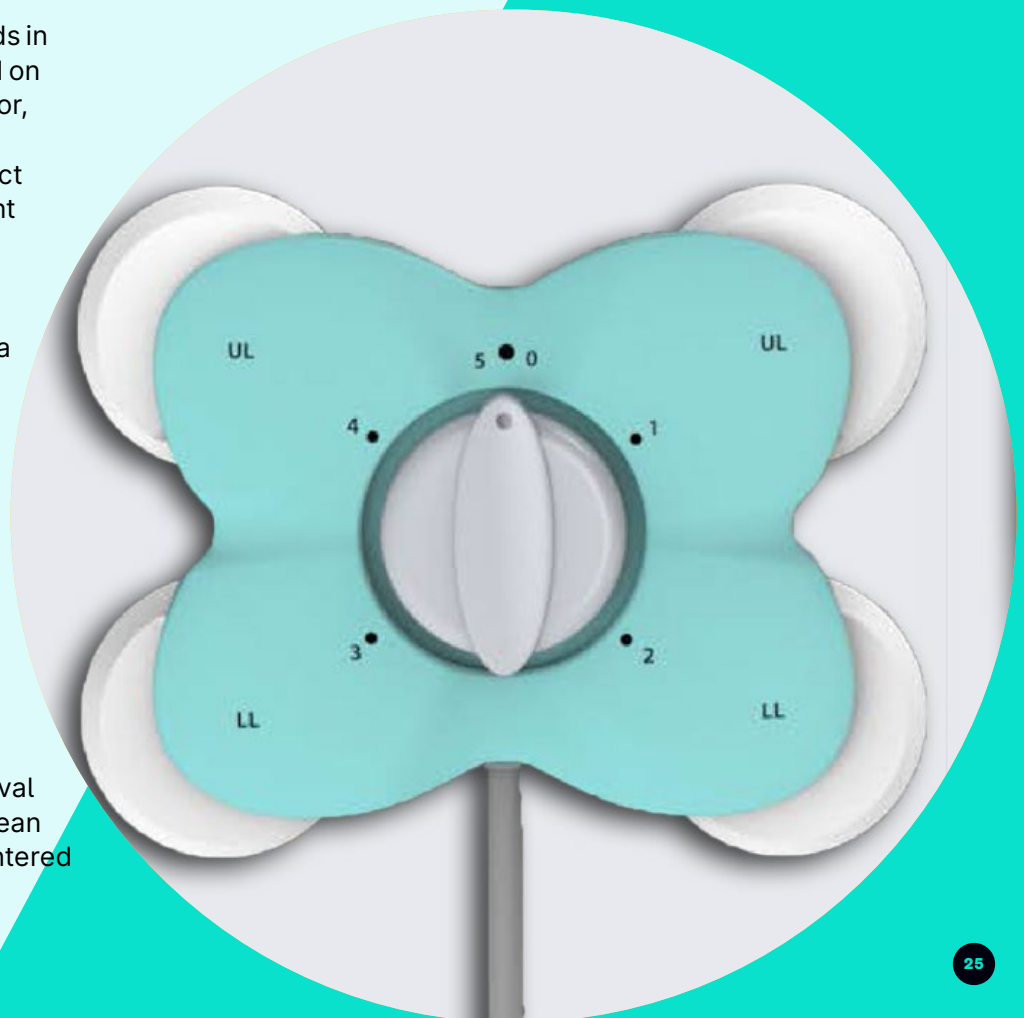
Neopenda, a U.S.-based IBE, was founded in 2015 by two biomedical engineers, Sona Shah and Teresa Cauvel. The company has developed neoGuard, a clinical vital signs monitor designed to help provide high-quality care to patients in resource-constrained health facilities. It measures four primary vital signs and provides clinical, timely data so that healthcare workers can respond rapidly and patients can receive the care that they need.

The company is still at an early stage. Having received \$60,000 in seed funds in 2015, in 2016-17 the founders focused on designing and developing their monitor, traveling to Uganda to work out their future strategy for bringing the product to hospitals there, and finding the right partners to support the company.⁴¹ Through a kickstarter campaign and support from Vodafone Americas Foundation and Cisco CSR, Neopenda secured a further \$440,000 in committed funding.⁴² The founders also received a grant from Grand Challenges Canada. With product development continuing, in 2018 they spent three months in the TechStars Chicago accelerator, opened an office in Kampala, and continued to strengthen regulatory, manufacturing, and customer pipeline development.⁴³

Neopenda received regulatory approval in Kenya in 2020, and CE Mark (European Union) approval in 2021, when they entered

the Kenyan market. With the CE Mark approval the company secured a further \$1.4 million in funding (70 percent of its post-seed round target) and will use the funding to expand its team and focus on marketing the product, initially in Kenya.

As one IBE founder noted, “Deep tech startups need to go through multiple phases: proof of science, proof of technology, proof of product, and then proof of market.” Navigating these stages successfully requires both technical expertise and business skills. The healthcare IBEs highlighted here were founded by skilled experts who have dedicated a significant amount of time conducting R&D and iterating product design. These efforts were enabled by grants, competitions, and government support. While waiting for regulatory approval, these companies have planned ahead for customer acquisition and expansion, as well as for securing partnerships. Given these traits, these IBEs have high potential to scale and have impact in their respective markets.



ACCESS TO CAPITAL

Access to capital was the highest ranked challenge for founders in Endeavor Insight's survey, as illustrated by the graph below, with 72 percent of interviewed founders citing it as a major or severe obstacle to growing their company. Although securing capital is a challenge, founders reported that when they do receive it, it has proved vital for accelerating growth and enabling them to hire more competitive talent.

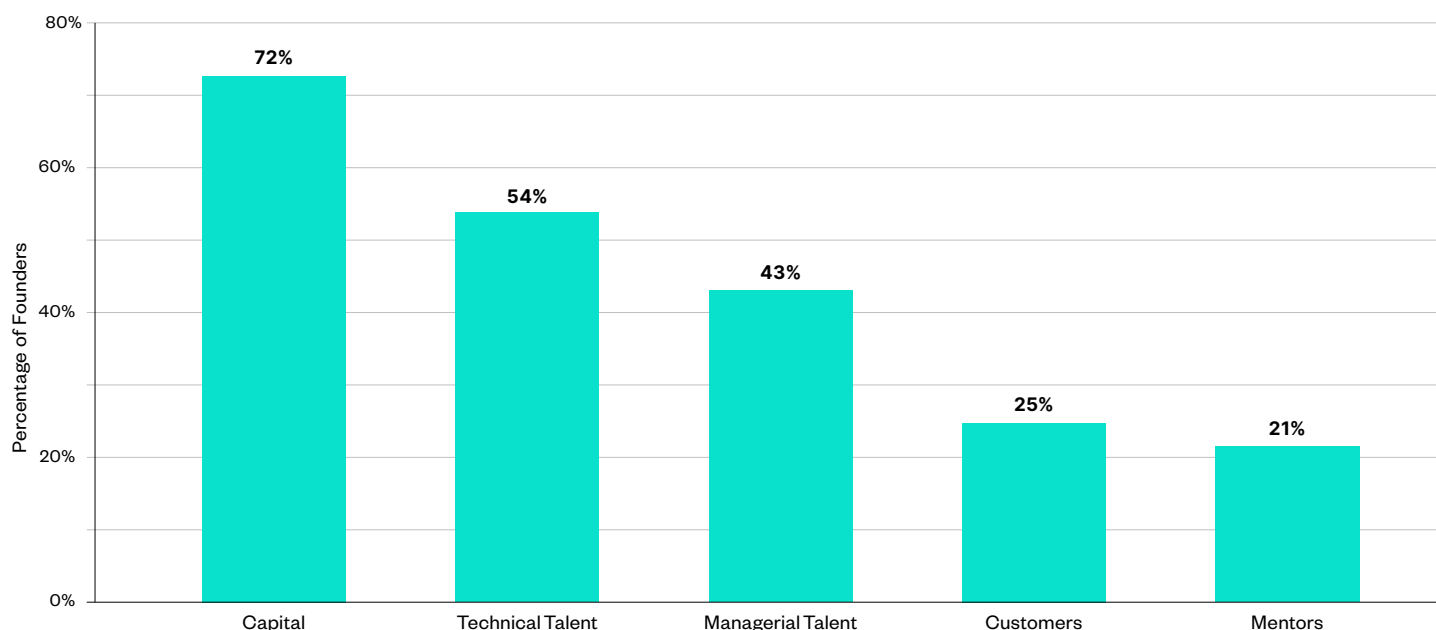
Founders of healthcare companies cited several challenges in acquiring capital. Investors often lack technical knowledge of healthtech products, and therefore rely on support organizations or government partnerships to provide indications of a company's potential. According to one founder, "There is a limited understanding of the healthcare and technology space. Many investors have their backgrounds in finance or have MBAs, and they have a fixed set of questions which work if you are an e-commerce or highly commercial startup, not so for an organization like ours."

There are also geographic challenges, with many foreign investors not understanding local markets, including the specific needs of rural or remote populations, as well as vernacular languages.

It is time- and resource-intensive for founders to build connections in order to attract investors and inform them about the sector. **Venture capital** is still not widespread in the sector, which leaves many founders to rely on international donors and development financial institutions (DFIs). These factors mean that it can take more than a year to close a financing deal. Ticket sizes are often small, meaning that the acquired capital lasts for only 12-18 months before founders must open another round, absorbing more time that could be spent focusing on the operational side of the business.

There are funding gaps, particularly at the seed stage and between the pilot/early and growth stages. According to

GREATEST OBSTACLES REPORTED BY FOUNDERS OF HEALTHCARE COMPANIES



Note: Figures represent the percentage of interviewed founders of healthcare firms who reported access to each category as a major or severe obstacle.

Source: Endeavor Insight interviews and analysis. Sample size: 46 founders.

one entrepreneur, early-stage healthcare companies in India face a paradox whereby they need to show significant traction in order to attract funding from investors that are ostensibly seed-focused. A Nigerian entrepreneur recounted a similar problem: “I have friends who have had to close their companies not because they were not good entrepreneurs, or did not have a good product, but they just couldn’t get that initial funding to make some progress. Early capital is scarce.”

These findings resonate with a report by USAID, which found that there is often a mismatch between the types of capital available in terms of return expectations and duration, and what is needed to support them. It can therefore be difficult for innovators to reach a point of minimum commercial viability.⁴⁴

Securing capital is particularly challenging for local founders based in sub-Saharan Africa or India, given that many large investors are based abroad, and the time spent networking is by necessity more complex and time-consuming. This is more the case for IBEs, only 52 percent of which raised capital, than for service companies (71 percent). The proportion of service companies that have scaled to 50 or more employees is also twice as high, at 36 percent, as that of IBEs. This is to be expected, as such scaling tends to be a function of capital, given that hiring personnel is costly. As a result, service companies are overrepresented in the top 20 percent of companies by employee size, comprising 64 percent of those high-scaling firms.

Another factor that may explain the investment bias against IBEs emerged in interviews, with many IBE founders reporting that investors are often less interested in physical products than in digital solutions because of the perception of greater risk and lower profits that is

associated with the former. This may partly stem from a systemic geographic advantage, given that OECD-based IBEs raised capital more frequently and in higher amounts than both service companies and IBEs based in sub-Saharan Africa or India.

Africa-based companies that were able to secure investment struggled to receive large ticket sizes. Of the companies that raised capital, only 19 percent of those in sub-Saharan Africa raised a total of \$3.5 million or more since their founding, compared to 43 percent of Indian companies and 61 percent of OECD-based companies.

Endeavor Insight’s research found that while **institutional investment** is increasingly available in these emerging markets, it is primarily provided by impact investors, not traditional investment firms. Approximately two-thirds of companies raised some institutional investment, with founders reporting that having preexisting connections with these investors was an important factor behind them securing such funding. The data also showed that 61 percent of the institutional investors supporting healthcare companies are based in the OECD, implying a shortage of local institutional investment. Founders also noted that some investors claim to be impact-focused but do not act as such when making deals, seeking higher returns than impact-focused businesses would normally have. Founder interviews suggest that some impact investors seek internal rates of return (IRRs) of 25 percent or more, which approach the IRR goal of 30 percent that is typical of conventional venture capital,⁴⁵ while returns in the high single digits or low teens may be more realistic for healthcare firms.

Angel investors are an important source of funding, but there are geographic disparities in companies that have been able to attract angels. Only 17 percent of sub-Saharan

African companies secured funding from this source, compared to 29 percent of Indian companies and 40 percent of those based in the OECD. Of all the companies in Endeavor Insight's dataset, 28 percent received angel investment. Most angels who support Indian or OECD companies are local to the same market as their investees, but this is not the case for African companies. There is a need for more local angel investment in sub-Saharan Africa and India, especially because founders reported that angels who were also entrepreneurs provided high-quality mentorship.

Grants — from foundations, philanthropies, and governments — were cited as a critical source of funds for early-stage development, particularly for IBEs that needed to demonstrate proof of concept. Perhaps because of struggles to attract other forms of capital, grants are more common for IBEs, 44 percent of which have received grant funding, than for service companies, 27 percent of which had.

In total, 35 percent of healthcare companies in the dataset had received grant funding. Again there are geographic differences, with nearly half of African and OECD companies receiving grants, compared to only 28 percent of Indian companies. Grants can serve as a bridge to other sources of funding, as they can act as a seal of approval. Interviewed founders also reported that completing the paperwork associated with grant disbursements is cumbersome, and that receiving the payments can be harder than winning the grant.

Loans are the rarest form of financing in the healthcare sector, with only about 5 percent of companies receiving them. Founders reported that commercial banks are hesitant to provide loans, particularly to IBEs, a funding gap that is often filled by grant-awarding foundations.

Given the challenges in accessing capital, many founders of healthcare companies reported **bootstrapping**. This was mainly out of necessity because of the difficulty in attracting investment, and like in other geographical contexts, it predominantly involved taking loans from friends and family within founders' existing circles. However, in some cases, bootstrapping was a deliberate strategy in order to have time to figure out their business model, without diluting their vision through external investors' influence.

Investment in the sector is growing, providing an opportunity to fill existing gaps in funding for entrepreneurial companies. In India, healthcare saw cumulative investment of \$1.1 billion in 85 enterprises in 2010-19, with a 173 percent jump in 2019 to \$467 million, driven by the entry of commercial investors into segments such as online pharmacy and specialty hospitals and clinics.⁴⁶ In both India and sub-Saharan African countries, government investment also helps fill funding gaps for young companies. For example, Startup India is a national initiative that does so across sectors, and several state governments within India offer similar opportunities. **Prantae Solutions** (see Feature on pp. 24-25) has received support from both Startup India and Startup Odisha, the latter being a local state scheme.

The **COVID-19** pandemic has further spurred investment in healthcare companies. The e-health sector in Africa broke through in 2020, attracting funding of \$103 million, more than previous five years combined, with ten e-health companies raising more than \$1 million.⁴⁷ And according to the WHO, COVID-19 has spurred over 120 healthcare innovations in Africa, 58 percent of which were ICT-driven, 25 percent based on 3D printing, and 11 percent were robotics.⁴⁸

ACCESS TO TALENT

Access to talent was the second highest ranked challenge in this study. Recruiting technical talent is more of a challenge than qualified managerial talent for healthcare companies, with 54 percent of surveyed founders reporting it as a major or severe obstacle, compared to 43 percent for managerial talent.

Hiring and training new employees require significant time and resources, and hiring choices are consequential for a company's performance. The effort required to build a productive and motivated team, particularly in leadership positions in the early stages, is substantial and important for later growth. Founders frequently mentioned that they had lacked the financial resources to pay the levels of salaries that would have attracted more qualified applicants, particularly when they were bootstrapping. Because talent is expensive, securing investment allows more experienced and productive teams to be hired.

Many founders reported that hiring technical talent, such as data scientists and software developers, was a challenge. Remote

talent was a solution for some companies, especially in contexts where qualified local professionals were moving abroad.

When expanding to new geographies, it can be difficult to connect to the local talent pool, which is required to succeed in that market, without preexisting connections. Nigeria's **Helium Health** has employed a successful expansion strategy that emphasizes local talent acquisition. The company focused on acquiring small, profitable firms in other countries that have high impact but struggle to access capital. Through this strategy, Helium Health has entered new markets while simultaneously acquiring local talent with relevant language abilities and contextual knowledge.

Founders whose businesses serve more rural areas reported hiring employees who were already in, or close to, those locations. According to founders, not only do such candidates have more knowledge of the market, but they are also likely to share the company's mission because they may have experienced the same healthcare issues that the company is addressing.



IV. Support Ecosystems

The quality and accessibility of support offerings influence entrepreneurial ecosystems.

SUPPORT AND MENTORSHIP

Participation in programs offered by support organizations is fairly common, with 65 percent of companies having participated in one, a ratio which was comparable across regions and innovation types.

Support organizations provide many benefits to healthcare companies, with founders of IBEs more likely than those of service companies to describe the positive aspects of these programs in interviews. One of the main benefits is that participation in a support program can help to establish credibility, particularly with investors and B2B customers. Support programs can also provide opportunities to network with large capital providers, particularly if they have an international focus.

IBE founders noted two benefits of support organizations that are particular to their innovation type. Many programs provide access to laboratory facilities and equipment, providing a crucial benefit for those founders that are not affiliated with a university. As one founder noted, “It’s helpful to gain access to high-end facilities without investing capital to access that infrastructure and equipment. In biotech, the investment levels needed to set up a lab are enormous. For a startup like us, incubation facilities offer us these facilities on payment of a monthly rent.” Support programs can also provide training on business management and dealing with logistics such as company registration, auditing, and regulatory compliance, helping to fill a gap in many founders’ experience.

At the same time, entrepreneurs also reported some shortcomings. According to several founders, support programs

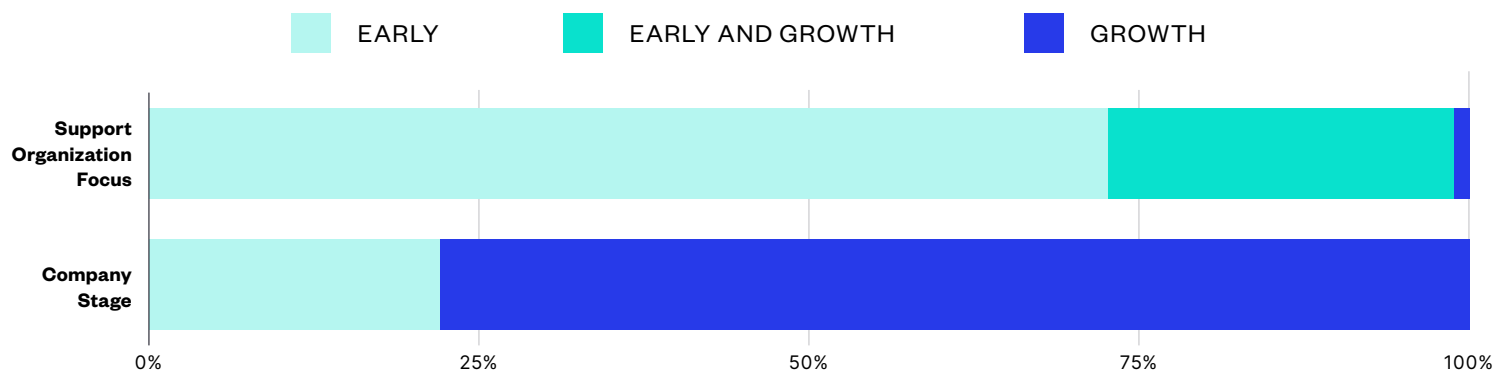
are less helpful to them when they provide generic advice or classroom-style talks, as opposed to tailored coaching on specific issues that the founders are facing. Similarly, there is sometimes a mismatch in curricula. For example, one IBE founder reported how although a support program focused on the health sector, it only provided guidance on digital health, which was not relevant to their company.

There can also be a lack of consideration for stage, with founders reporting that some support organizations promote staying in a “startup mindset”. The graph on the next page shows that most support organizations for healthcare companies focus on earlier stages, while relatively few assist with growth and expansion. Out of 143 support organizations in the sector, 101 served the pilot or early stage, while only three served the growth or expansion stage, and 39 supported both. In contrast, Endeavor Insight found that a large majority of entrepreneurial healthcare companies were at the growth or expansion stage — 181 out of 228.

Endeavor Insight’s data shows mixed results for healthcare companies from participation in a support program. There is a positive association for raising capital, with 67 percent of participants succeeding in doing so, compared to 52 percent of those that did not participate in a support program. But the opposite was true for scaling to 50 or more employees — 23 percent of those that participated in a support program scaled, compared to 35 percent of those that did not. These findings are different from research published in 2021 by the Global Accelerator Learning Initiative (GALI), which

COMPARISON OF SUPPORT ORGANIZATION OFFERINGS AND COMPANY STAGE IN THE HEALTH SECTOR

Support organizations tend to focus more on the earlier stages, whereas more companies are at the later stages of growth.



Note: Data on support organizations includes those that served at least one healthcare company in the study. Support organizations were categorized according to the stage focus of their programs. "Early" includes the pilot stage, whereas "Growth" includes expansion. Out of the 143 support organizations that supported healthcare and had data available, 101 supported the early stage, 3 supported the growth stage, and 39 supported both. Healthcare companies were categorized as being at the early stage if they were 0 to 4 years old or at the growth stage if they were 5 or more years old. This data included 228 companies, of which 47 were at the early stage and 181 at the growth stage.

Sources: Endeavor Insight interviews and analysis; LinkedIn; PitchBook; Crunchbase; support organization websites. Sample sizes: 143 support organizations and 228 companies.

found that companies which participated in accelerator programs were more likely to reach higher scale and receive more outside investment.⁴⁹ The opposite finding for scale may potentially be the result of companies becoming more efficient and requiring fewer employees, or perhaps due to founders not being able to focus on business growth and expansion as a result of participating in support programs.

There are fewer local support organizations available for African than Indian companies. Only 11 percent of African companies participated in a support program that was headquartered in the same country, compared to 84 percent of Indian companies. This is important because international programs tend to

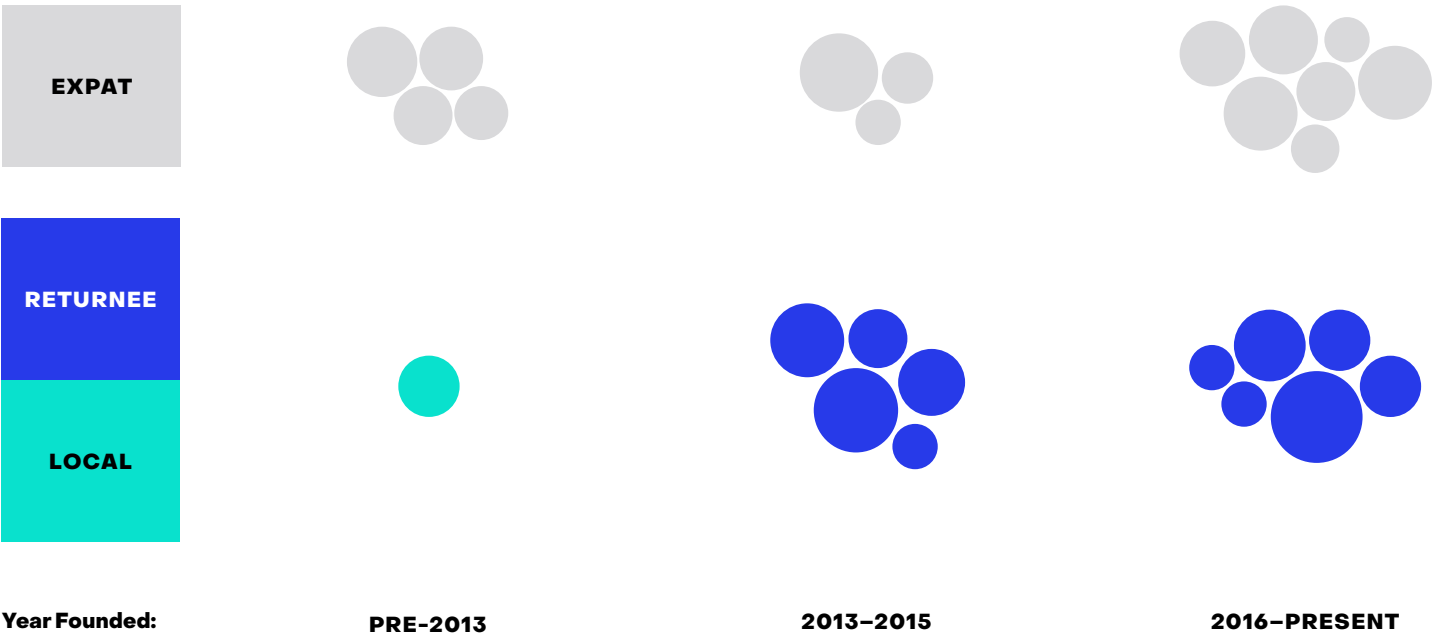
lack knowledge of local markets, meaning that they are unable to identify potential local customers. Similarly, only 38 percent of mentors for African companies were local, compared to 73 percent for Indian companies.

There is a limited amount of high-quality mentorship in the healthcare sector. Founders reported that support organizations often provided inexperienced mentors, who did not understand their technology or the sector. Outside of support organizations, interviewed founders also felt that there is a dearth of qualified, experienced mentorship in general. Despite this, these up-and-coming entrepreneurs do themselves have a desire to mentor and invest in others.

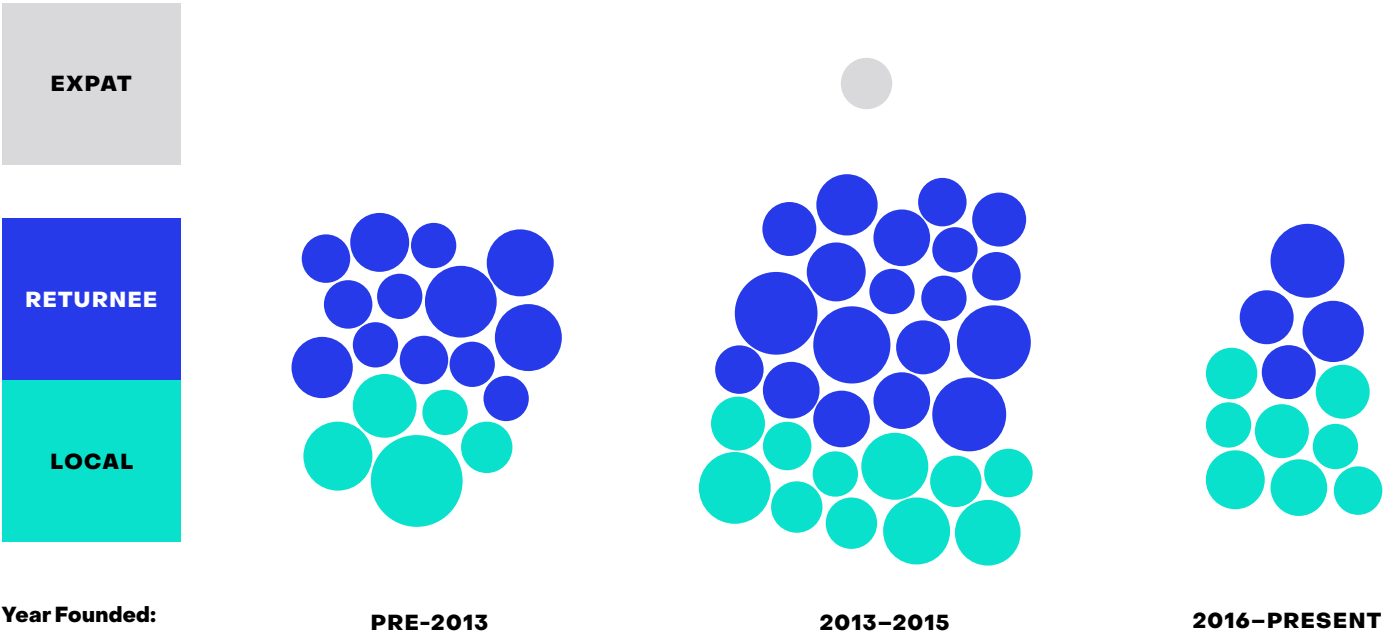
FOUNDING TEAM BACKGROUNDS AND CONNECTIONS FOR HEALTHCARE FIRMS BY REGION

The size of the circle is proportionate to the resources a company received including mentorship, investment, and other support.

In Sub-Saharan Africa, Most Well-Connected Healthcare Companies Are Expat-Led



In India, Most Well-Connected Healthcare Companies Are Local- or Returnee-Led



Note: Companies were included if they received resources or services from at least five investors, mentors, and/or support organizations. Each bubble represents a company, and its size is proportionate to the number of relationships it had with those providers. Empty sections indicate the absence of companies with at least five investment or support relationships. Founding teams are defined as “local” if they have no expat or returnee co-founder, “returnee” if they have at least one returnee but no expat co-founder, and “expat” if they have at least one expat co-founder.

Sources: Endeavor Insight interviews and analysis; LinkedIn; PitchBook; Crunchbase; company websites. Sample size: 948 connections.

BUILDING AN INNOVATIVE HEALTHCARE ECOSYSTEM: LESSONS FROM INDIA

In the past few decades, India has developed a robust ecosystem for healthcare research and innovation, including biotech and medtech, led primarily by local entrepreneurs with government support. This ecosystem encompasses **government agencies, universities, investors, and support organizations.** While gaps in the ecosystem continue to be addressed, other countries can apply and adapt lessons from India's experience in strengthening their own national innovation capacities.

The healthcare solutions being implemented in sub-Saharan Africa are less likely to involve physical products or to be developed locally, instead being imported from foreign countries. The majority of innovative Indian healthcare companies in Endeavor Insight's dataset are IBEs, while most of those in sub-Saharan Africa are service companies. Additionally, founding team backgrounds are markedly different: only 3 percent of founders of healthcare companies in India were expats, compared to half of those in sub-Saharan Africa. As the visualization on the previous page illustrates, the healthcare companies that have received the most resources and services in India are local- or returnee-led, while those in sub-Saharan Africa tend to be expat-led.

The Indian government has invested heavily in domestic R&D in the health sector, bolstering the country's long-term capacity for innovation. The Department of Science and Technology (DST) funds research centers and support organizations across the country, in both larger and smaller cities. The more specialized Department of Biotechnology (DBT), which was founded in 1986, invests in biotech research, establishes international partnerships, and is involved in developing domestic industry.⁵⁰ Government support for these departments

is significant: in 2020, DST had a budget of approximately \$863 million, while DBT had a budget of around \$375 million.⁵¹ DBT provides scientific innovators with critical guidance in intellectual property protection and business logistics, areas that they are often unfamiliar with, to facilitate the lab-to-market journey.⁵² One of its key research institutes, the Center for Cellular and Molecular Platforms (C-CAMP), provides state-of-the-art facilities to experimental research, as well as funding and incubation to translate innovations into commercial products.

Founded in 2012 by DBT, the Biotechnology Industry Research Assistance Council (BIRAC) is a major national mobilization agency for applied biotech R&D. It provides different types of programming for companies at various stages of growth. BIRAC is prominent in offering grants for companies at the pre-seed and pilot stages, enabling them to **experiment and reach a minimum viable product.** It also financially supports incubators across India through public-private partnerships, and connects new companies to those organizations for support. For companies that have already developed a product, BIRAC provides assistance in going to market by including them in trade showcases. As a result, companies are able to **establish connections with customers, both domestically and in other countries for exports.**

These government bodies are key implementers of two national initiatives: Make in India and Startup India. Launched in 2014, Make in India focuses on **supporting indigenous innovation, intellectual property, and manufacturing.**⁵³ Startup India, launched in 2016, aims to facilitate the **process of starting up, assist with government procurement, and streamline procedures for entrepreneurs** across the

country.⁵⁴ It hosts an entrepreneurship portal for networking with investors and mentors, accessing free resources, and participating in startup competitions.⁵⁵

Within India's federal structure, state governments have a high degree of autonomy and control over funding. In supporting the healthcare sector, **state government efforts complement national initiatives.** For example, state-level institutions tend to lead the implementation of supporting healthcare research and entrepreneurship, while national-level agencies provide funding and coordinate efforts.

Innovators need technical training and access to resources in order to generate new ideas and develop new products,

and **universities have a large role to play** in this regard. In India, there are many public universities with high-quality STEM education, such as the system of Indian Institutes of Technology (IITs). These universities not only teach students basic sciences and offer research opportunities, but they also **provide the resources needed for researchers to commercialize their ideas** — including incubator programs and lab facilities. For example, Abhishek Sen co-founded **Biosense Technologies** while studying at IIT Bombay, developing easy-to-use, low-cost diagnostic devices. India's STEM-focused universities also serve as pipelines of local technical talent for entrepreneurial companies.

Indian universities and government agencies have developed strong ties to



local investors, which enables scientists and other innovators to bring new products to the market. **The country has a growing network of local angel investors, many of whom also serve as mentors given their own entrepreneurial experience.**

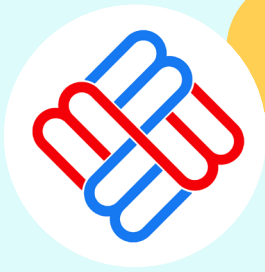
As India already had a thriving industry of manufacturing generic pharmaceuticals, entrepreneurs who led those manufacturing companies have gained interest in investing in newer, innovative subsectors.⁵⁶ Venture capital and other institutional investors are also locally available, though gaps at the growth stage and for riskier ventures continue to exist.

Notably, Indian institutions have built **connections with leading institutions in other countries for health research.**

In 2007, Stanford University, IIT Delhi,

and the All India Institute of Medical Sciences (AIIMS) — a consortium of public research universities — established the Stanford-India Biodesign program. For nine years, it served as a pipeline for training Indian innovators to develop entrepreneurial solutions to health challenges facing the country, return to implement them, and serve as mentors to train other Indians.⁵⁷ DBT has also established memoranda of understanding with several countries such as Australia, Germany, and Sweden to work together on scientific research.⁵⁸ Collaborations like this, which involve **the transfer of expertise or technology**, are a beneficial way to engage with foreign institutions.





CASE STUDY: MediBuddy

MediBuddy was formed by the merger in 2020 of DocsApp and MediBuddy. This case study follows the entrepreneurial journey of the founders of DocsApp, now co-founders of MediBuddy.⁵⁹

DocsApp co-founders Satish Kannan (*next page, right*) and Enbasekar Dinadayalane (*next page, left*) met while studying engineering at IIT Madras. Their studies introduced them to the healthcare sector, collaborating with hospitals on projects, cementing their desire to work in the healthcare space. The two went on to work for large healthcare companies, including Philips, before founding the company in 2015.

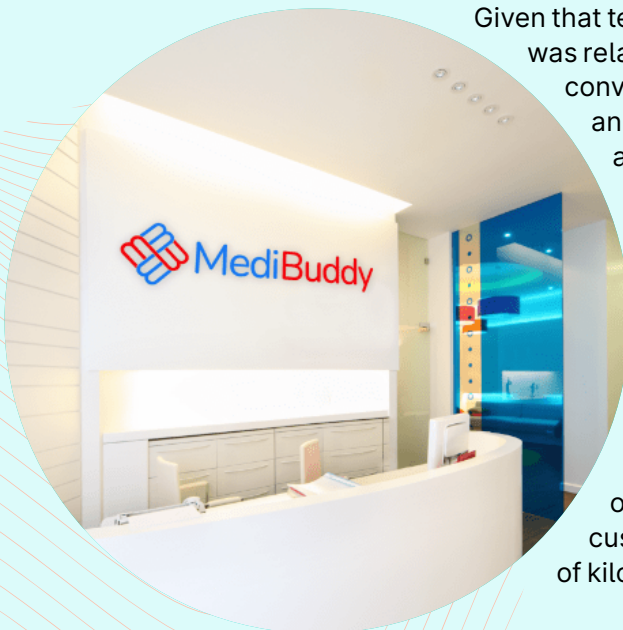
Kannan and Dinadayalane founded DocsApp with the intention, according to Kannan, of making “high-quality healthcare accessible to a lot of people.”⁶⁰ In India, the main healthcare infrastructure and specialist doctors are located in the largest cities in the country, leaving those in smaller towns or rural areas with limited access. The founders set up DocsApp as an online digital platform that connects healthcare providers and patients for consultations and telehealth, providing users with a specialist doctor’s consultation within 30 minutes through online chat or a phone call.

They initially incubated DocsApp at IIT Madras, which provided their first funding and office space, and later raised seed funding from Rebright Partners, enabling them to build and test their product. A further round of funding from Bessemer Venture Partners helped to push them towards the growth phase.⁶¹ This involved the introduction of different product and service lines, such as medicine delivery and lab tests, and they also started to look at geographic expansion.

By 2020, the company was starting to grow rapidly. Kannan attributes this in part to the COVID-19 pandemic, saying in 2020 that “the market is exploding now because COVID has happened, making it more difficult for people to go offline, and it’s also safe for them to stay at home and talk via another medium.”⁶² The pandemic accelerated behavioral changes, and with healthcare professionals now more willing to consult online, digital acceptance in the space took hold.

The DocsApp founders started talks with another Indian company, MediBuddy, which was in a parallel space. Kannan explains, “We had around 60 percent of our customers coming from very small towns. And MediBuddy was doing similar work, but with a focus on corporates, providing health benefits to their employees.”⁶³ The two companies used the same healthcare providers, pharmacies, or labs for their services, but had different customer profiles. Being in the same sphere, the two companies communicated and came to realize that a merger would be complementary and enable them to keep scaling. They merged in June 2020, after which Kannan explained, “Coming together increases the scale, it increases

Given that tele-consultation was relatively new in India, convincing doctors to use an online platform was a challenge, and the initial few months were spent bringing experienced doctors onto the platform. The founders steadily built trust with doctors, who began to see the benefits of being able to serve customers hundreds of kilometers away.



the customer base, it also increases the network. Today we have a network covering 95 percent plus of the PIN [zip] codes in the country, and together we help around 25,000 patients every day.”⁶⁴

The merger increased the platform’s network to encompass over 90,000 doctors, 7,000 hospitals, 3,000 diagnostic centers, and 2,500 pharmacies, providing healthcare access to over 30 million Indians.⁶⁵ The merged company goes by the name of MediBuddy, with Kannan as CEO and Dinadayalane as CTO. In tandem with the merger, the company raised \$20 million in a Series B funding round, which the company is using to increase its doctor base and patient reach, as well as to strengthen its technology.

In addition to strengthening its offering to healthcare centers, pharmacies and individuals, MediBuddy continues to strengthen in the B2B market and has played an active role in COVID-19 relief. The company

partnered with Google Pay to offer affordable, online consultations during the second wave of COVID-19 in India in May 2021.⁶⁶ MediBuddy also partnered with Smartworks, a managed office space provider, granting Smartworks’ members and employees access to online doctor consultations, health check-ups, COVID-19 tests, and medicine. MediBuddy is also managing Smartworks’ onsite clinics. The company is offering similar tailored packages to other organizations, facilitating staff consultations and COVID-19 testing.⁶⁷



V. Recommendations

This section provides practical recommendations for addressing the major challenges that healthcare company founders face.

There is great potential for entrepreneurs in sub-Saharan Africa and India to improve access to healthcare, reduce disease, and enhance the quality of life for millions of people. In order for the global community to maximize these benefits and make progress towards the SDGs, decision makers should take action to address the challenges that health entrepreneurs face and the systems-level gaps that persist. This section presents recommendations to improve the areas that most affect entrepreneurs: capital, talent, support, mentorship, and policy. Many of these recommendations involve cooperation

between different actors, in recognition of their complementary roles and the potential benefits from a well-connected ecosystem.

In addition to the interviews with founders, Endeavor Insight spoke with several investors, support organization leaders, and other experts on healthcare entrepreneurship in sub-Saharan Africa and India. The following practical recommendations for decision makers emerged from those conversations and the analytical findings of this report.

1

Improve access to growth capital by aligning the goals of investors and healthcare entrepreneurs.

Access to capital was the highest ranked challenge among the founders interviewed for this study. To address this obstacle, capital providers and entrepreneurial companies need to reach greater alignment in their goals. This would allow them to make existing processes more efficient and for both parties to benefit from the existing potential for growth in the sector.

In the wake of the COVID-19 pandemic, there is now a growing momentum of investment for global healthcare, with a sizable number of investors providing funding for the growth and expansion stages. Although founders reported that some impact-focused investment firms act similarly to conventional investors, mission-oriented impact investors have benefited many healthcare companies. When impact investors are clear about their expectations and provide patient capital with reasonable terms, they enable companies to grow and succeed. The long timelines for finalizing funding deals present another challenge,

as the delays can put young companies at risk of bankruptcy. To address this, greater communication about expectations is needed between investors and companies.

Founders noted that investors, who are often based outside of sub-Saharan Africa and India, frequently lack contextual knowledge of local markets. As a result, investors are often drawn to companies making products that they are already familiar with, rather than those that are tailored to the needs of the intended customers in developing countries. In healthcare, the most effective solutions account for contextual factors such as unreliable access to electricity, a need for portability, and cultural norms. Additionally, local entrepreneurs face greater difficulty in accessing capital than expats, who are often well connected to investors and understand how best to present their businesses to them. Local founders may not be as well versed in what investors like to see in pitches and presentations. Therefore, foreign investors

should be aware of cultural differences and build stronger connections with local subject-matter experts in their countries of focus before selecting companies. Foreign investors can partner with local capital providers in funding rounds, as the latter can provide important contextual information. For example, iungo capital is a Netherlands-based impact investment firm which co-invests with local angels, who also serve as mentors, in East African companies.⁶⁸

There is a need for greater local investment in these developing countries. Local investors are more likely to be aware of the context-based relevance of different companies, and they contribute to the self-sufficiency of entrepreneurial ecosystems. Because foreign capital tends to be less knowledgeable about local markets, greater local investment would reduce the risk perception for foreign investors. Decision makers should also encourage successful local entrepreneurs to serve as angel

investors for younger companies, especially in sub-Saharan Africa, to build up their entrepreneurship ecosystems. International donors and philanthropic organizations can contribute to this by supporting and expanding existing programs like the African Business Angel Network (ABAN) and Viktoria Business Angel Network (VBAN), which train and connect angel investors.

The COVID-19 pandemic has impacted connectivity between investors and entrepreneurs, as building networks requires greater intentionality online than in person. This situation is more advantageous for experienced founders with existing connections, rather than newer entrepreneurs who are struggling to raise capital. Software as a Service (SaaS) tools like Artha Impact's platform, which links early-stage founders in India to impact investors, can help mitigate these consequences by providing opportunities for connectivity.⁶⁹

2

Enhance early-stage support and funding opportunities for healthcare IBEs.

Invention-based enterprises are qualitatively different from service companies and require tailored support. IBEs have an element of risk because they experiment with creating new technologies, but they are essential for the success of the healthcare sector. The iterative R&D process needed to develop physical products can be supported by flexible, patient capital.

To enable scientists and innovators to test ideas, government agencies and support organizations can create mechanisms and provide resources for their needs. Grants in the early stages to transform an idea into a minimum viable product are particularly useful, and these can be provided by both the public sector and support organizations. Effective grantmaking would include greater risk tolerance and flexible grant periods during early-stage product development because groundbreaking innovations are time- and

resource-intensive. Also, early-stage IBEs frequently have to spend money to access research facilities and technical expertise, so support organizations and philanthropies can provide more cost-effective avenues for this.

Entrepreneurial inventors who seek to tackle healthcare issues through physical products often find it difficult to convince investors of the value of their business models, and institutional investors are hesitant to invest in companies because of their long development timelines. Support organizations can help entrepreneurs receive grants and secure customers at earlier stages to accelerate their growth and prepare them for institutional investment. At the same time, the public sector can underwrite risk and provide incentives for private institutional investors to move towards selecting companies at earlier stages of growth.

Donors and philanthropies who fund support organizations and wish to see more tailored solutions should also adopt a flexible approach to encourage these changes. This includes increasing

multi-year support and discretionary pilot funding, as well as non-financial assistance like programmatic expertise, to allow support organizations to refine their practices and capacity to serve IBEs.

3

Tailor support programs to the needs of the healthcare sector.

Support organizations can provide more tailored assistance to healthcare companies by accounting for the needs of the sector. By ensuring that the services they provide are relevant, they can better assist companies to build credibility in the healthcare system, acquire customers, and recruit talent.

As founders are often not well versed in aspects such as clearing regulatory requirements and securing intellectual property rights, support organizations can do more to help founders navigate the process of market entry. Programs can help founders plan for government approval from the onset, so that they are aware of requirements as they design their products. Providing access to lab facilities, technical assistance, and regulatory expertise simultaneously are key services that support programs can provide to healthcare entrepreneurs.

Support organizations should also form partnerships with hospitals and other institutions in the healthcare system to help entrepreneurs establish credibility with practitioners and a reliable track record. This would be a valuable service because

the support of doctors and data-backed evidence are both needed for healthcare companies to gain procurement, especially for IBEs. Bangalore-based C-CAMP uses its standing within the healthcare system and its connections to hospitals across India to help companies with novel ideas run pilot programs and build up a year's worth of data, which sets them up for success with potential clients and investors. Through pilot trials, founders can also involve end users in the product design process to ensure context specificity, which would help increase customer interest.

There is also unrealized potential for support organizations to help entrepreneurial companies in talent acquisition, which was the second highest ranked challenge in this study. Technical talent is particularly important, as specialized expertise is key to the success of companies in this sector. Hiring local talent when expanding to new markets is a potential solution to this issue, as is remote talent in the context of COVID-19. Support organizations can connect companies to universities and research institutes to establish pipelines for recruiting technical talent.

4

Prioritize mentorship from local actors with relevant experience.

Many founders who were interviewed for this study reported the lack of qualified mentors in the healthcare sector. Successful entrepreneurs who have scaled their companies and demonstrated impact have much to offer their local ecosystems. They can serve as effective mentors and angel investors for new healthcare founders and also help them to reach scale.

Support organizations should prioritize providing mentorship from local entrepreneurs who have experience in healthcare or biotech. In particular, those who have technical expertise are especially valuable because companies in developing countries are often in need of such assistance. Support organizations can tap into their alumni networks, as well as connections at affiliated investment firms, to encourage successful founders to become mentors. Donors should likewise elevate support organizations and networks that are led by, or have a substantial inclusion of, successful local founders, as opposed to those led by individuals without entrepreneurial experience in healthcare.

Although many of the mentors that support organizations match participants with have experience as research scientists or physicians, some lack the firsthand

business acumen to best assist companies at the growth and expansion stages. In addition, local mentors are likely to be more cognizant of how a company's invention or product would fit into the context and social fabric of its intended customers. Support organizations should build meaningful connections with local founders who have successfully scaled, and encourage them to become mentors.

Many African economies in particular would benefit from greater local mentorship and angel investment in healthcare. Localized support for founders would be beneficial not only to build up local entrepreneurial ecosystems, but also for these markets to have context-specific healthcare solutions that are tailored to the needs and resources of their populations. A greater level of coordination and trust within the entrepreneurial community would help in this regard. Development institutions and other foreign donors can incentivize the establishment of those networks through their role as conveners and resource providers. They can also encourage support organizations and expat-led companies to promote locals to leadership positions in order to contribute to the growth of the local entrepreneurial ecosystem.

5

Foster an enabling environment for entrepreneurship by building long-term innovation capacity.

At a more fundamental level, decision makers in African countries and India should build up their long-term innovation capacity for local founders to succeed. Linkages between government agencies, hospitals, research universities, and industry are vital for founders to start and grow their companies. Governments should invest in healthcare systems, science, technology, engineering, and mathematics (STEM) universities, as well as R&D facilities in underserved areas in their countries.

The COVID-19 pandemic has presented an opportunity for a greater focus on this, as it has highlighted the need for resilient healthcare systems that can reach and serve rural and underserved populations. Because effective healthcare requires context-specific considerations, local entrepreneurs will be best placed to develop innovative solutions if they have the resources to do so. This is especially important in sub-Saharan Africa, where there is a significant need for investment in local R&D capacity

and technical expertise to foster long-term innovation. There is substantial potential for more public-private partnerships, through which private enterprises can procure customers for their innovations.

Other elements in the ecosystem include local universities, research institutions, and hospitals. These organizations can support the development of healthcare companies, especially IBEs, by promoting “learning by doing” and an entrepreneurial mindset among students and medical practitioners. Hands-on experiences like class projects and innovation competitions are an effective way to encourage the development of entrepreneurial skills. Furthermore, conducting greater levels of research in the hard sciences at local universities would have the benefit of increasing the number of professionals with advanced degrees relevant to the healthcare sector. These steps would enable those individuals to pursue careers in which they can apply their technical skills outside of academia to local needs.

As the health sector tends to be driven by public funding, greater government investment is needed to bolster domestic R&D capacity. Governments should financially support both basic research in biological sciences and the translation of

that research into usable products for the general public, which can also contribute to national intellectual property. International development institutions and other foreign donors are also in a position to shape local entrepreneurship ecosystems in healthcare. These foreign actors should reinforce local efforts to build up infrastructure, educational institutions, and R&D capacity by providing financial resources and participating in knowledge transfers.

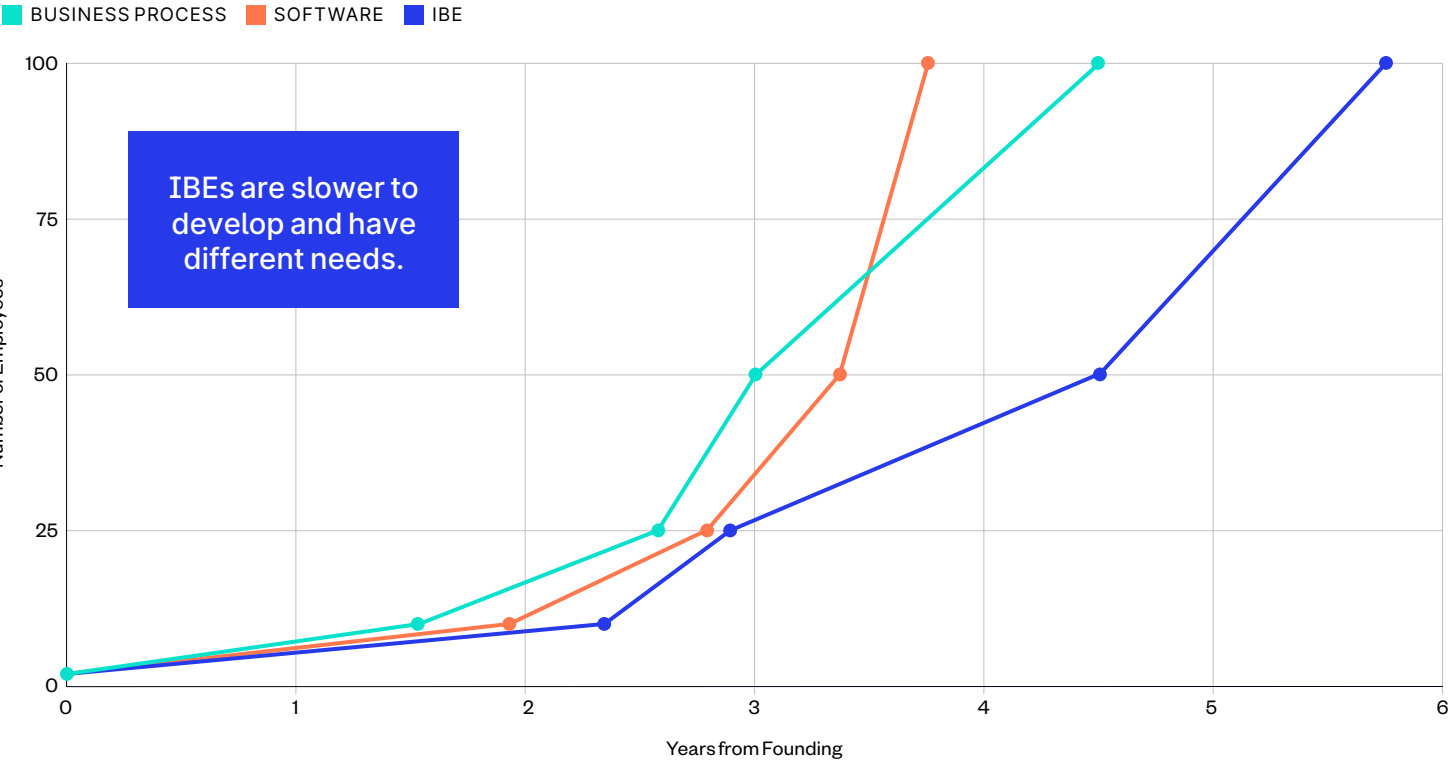
On the policy front, entrepreneurs would benefit from clearer, well-enforced regulatory environments. Regulations are not only important for companies with physical products, but also for software companies, which have to keep track of data management and privacy standards. Governments should provide clear, digital resources that explain what founders need to know on regulations and intellectual property, as India has done through the Startup India portal. In relatively new industries in emerging markets, like biotech or digitized healthcare, policies are often still in development. Policymakers can benefit from the experiences of successful founders in creating productive regulatory environments by inviting them to workshops and discussions during the process of drafting legislation.

Through these principles, decision makers can empower innovative entrepreneurs in sub-Saharan Africa and India to grow their companies and enhance the quality of and access to healthcare.

Top Recommendations for Decision Makers

Entrepreneurs	<ul style="list-style-type: none"> • Develop context-specific products, and include the intended end users in the product design process. • Give back to the local entrepreneurial ecosystem as a mentor and angel investor.
Investors	<ul style="list-style-type: none"> • Clarify expectations to entrepreneurs, and reduce the length of time required to finalize deals. • Build stronger connections with subject matter experts and local investors prior to selecting companies. • If based abroad, partner with local capital providers in funding rounds. • Provide patient, flexible capital to IBEs, including experimental R&D grants.
Support Organizations	<ul style="list-style-type: none"> • Tailor programs to the needs of the sector, such as building credibility in the healthcare system, acquiring customers, and recruiting talent. • Enhance early-stage support for healthcare IBEs, including access to lab facilities and technical expertise. • Provide mentorship from local entrepreneurs with experience in the sector.
Donors and Philanthropies	<ul style="list-style-type: none"> • Increase multi-year support and discretionary pilot funding, as well as non-financial assistance like programmatic expertise, to allow support organizations to refine their practices. • Support and expand networks that train and connect local angel investors. • Encourage support organizations and expat-led companies to promote locals to leadership positions in order to bolster the local entrepreneurial ecosystem. • Reinforce local efforts to build up infrastructure, educational institutions, and healthcare-specific R&D capacity.
Policymakers	<ul style="list-style-type: none"> • Foster an enabling environment by investing in domestic STEM universities, translational research, and R&D capacity, especially in underserved areas. • Improve the clarity and enforcement of regulations, and include entrepreneurs in the policymaking process. • Establish more public-private partnerships with entrepreneurs to fill gaps in healthcare provision.
Universities and Research Institutes	<ul style="list-style-type: none"> • Promote “learning by doing” and an entrepreneurial mindset among students. • Conduct greater levels of research in the hard sciences, and support researchers in taking new inventions and products to the market. • Encourage STEM students to apply their knowledge to local needs.

COMPARATIVE DEVELOPMENT TIMELINES OF COMPANY INNOVATION TYPES



*Note: Data includes entrepreneurial companies that reached 100 or more employees across three sectors (agriculture, healthcare, and clean energy).
Source: Endeavor Insight interviews and analysis. Sample size: 131 companies.*

Glossary

Biotech: Technology or industrial processes using living things such as cells and bacteria.

Bootstrapping: Founding and building a company without external investment, relying instead on personal capital and the company's operating revenues.

Entrepreneurial companies: For-profit businesses that are started by individuals. This excludes businesses that began as government entities or subsidiaries of larger companies.

Founder backgrounds:

Expatriate: Founders who have started a business in a country that is not their home country.

Local: Founders who have started a business in their home country, without educational and/or work experience abroad.

Returnee: Founders who have started a business in their home country after gaining educational and/or work experience abroad (also referred to as "boomerang").

Healthtech: The use of technological solutions for healthcare products and services.

Innovation types:

Business process companies: Companies that primarily deliver a product or service that requires "on-the-ground" operations, and may also involve the use of technology.

Invention-based enterprises (IBEs): Companies that conduct research and development, and manufacture at least one component that is a physical product, oftentimes where the innovation is unique enough to be patentable.

Service companies: Businesses whose primary innovation is not a physical product, including business process companies and software companies.

Software companies: Companies that have primary activities in developing and selling technological solutions and platforms, such as e-commerce or financial technology.

Investment types:

Angel investment: An investment in a company made by an individual, not on behalf of a business or investment firm.

Institutional investment: An investment made by a company or organization.

Venture capital: Investment in businesses that have high growth potential. Venture capitalists (VCs) often provide expertise in finance and operations, in addition to capital.

Mentorship: A relationship through which a mentee will meet a mentor; in this study, defined as meeting at least three times for a minimum of 30 minutes to discuss critical business issues.

Network: A group of actors working to support local entrepreneurs. This includes capital providers such as investors and foundations, support organizations, government and international aid agencies, and experienced entrepreneurs.

Scale: A measure of a company's growth; in this study, defined as employing 50 or more people.

Startup: New companies less than one year old with at least one employee.

STEM: Science, technology, engineering, and math.

Support organizations: Organizations offering skill-development programs, investment, mentoring, or other support for entrepreneurs. These include incubators, accelerators, and other programs.

Telehealth: The delivery of healthcare, health education, and health information services via remote technologies.

Endnotes

- 1 World Health Organization. "The Global Health Observatory." who.int/data/gho/indicator-metadata-registry/imr-details/4834. Accessed 10 Aug. 2021.
- 2 United Nations. "United Nations Global SDG Database." unstats.un.org/sdgs/indicators/database. Accessed 10 Aug. 2021.
- 3 Ibid.
- 4 United Nations. "The Sustainable Development Goals Report 2020." 2020. unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf. Accessed 10 Aug. 2021.
- 5 World Health Organization. "Adolescent pregnancy." 31 Jan. 2020. who.int/news-room/fact-sheets/detail/adolescent-pregnancy. Accessed 26 Aug. 2021.
- 6 United Nations. "The Sustainable Development Goals Report 2020." 2020. unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf. Accessed 10 Aug. 2021.
- 7 United Nations. "United Nations Global SDG Database." unstats.un.org/sdgs/indicators/database. Accessed 10 Aug. 2021.
- 8 Ibid.
- 9 United Nations. "The Sustainable Development Goals Report 2020." 2020. unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf. Accessed 10 Aug. 2021.
- 10 Runge, Claus & Zahid Torres-Rahman. "Family Planning is an Essential Healthcare Service and Businesses Must Make It a Priority." *Business Fights Poverty*. 3 Aug. 2021. businessfightspoverty.org/family-planning-is-an-essential-healthcare-service-and-businesses-must-make-it-a-priority. Accessed 26 Aug. 2021.
- 11 Family Planning 2020. "Family Planning's Return on Investment" 2020. familyplanning2020.org/sites/default/files/Data-Hub/ROI/FP2020_ROI_OnePager_FINAL.pdf. Accessed 26 Aug. 2021.
- 12 United Nations. "The Sustainable Development Goals Report 2020." 2020. unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf. Accessed 10 Aug. 2021.
- 13 Ibid.
- 14 Ibid.
- 15 United Nations. "United Nations Global SDG Database." unstats.un.org/sdgs/indicators/database. Accessed 10 Aug. 2021.
- 16 Nature. "Thousands of measles deaths averted by Indian vaccination campaign." 8 Mar. 2019. [nature.com/articles/d41586-019-00819-1](https://www.nature.com/articles/d41586-019-00819-1). Accessed 10 Aug. 2021.
- 17 United Nations. "United Nations Global SDG Database." unstats.un.org/sdgs/indicators/database. Accessed 10 Aug. 2021.
- 18 United Nations. "The Sustainable Development Goals Report 2020." 2020. unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf. Accessed 10 Aug. 2021.
- 19 Ibid.
- 20 Mukhopadhyay, Bratati & Dipika Sur, et al. "Typhoid fever: Control & challenges in India." *Indian Journal of Medical Research*. Nov. 2019. [ncbi.nlm.nih.gov/pmc/articles/PMC6977362](https://pubmed.ncbi.nlm.nih.gov/pmc/articles/PMC6977362/). Accessed 10 Aug. 2021.
- 21 USAID Center for Innovation and Impact. "Investing for Impact: Capitalizing on the emerging landscape for global health financing." May 2019. [usaid.gov/sites/default/files/documents/1864/investing-for-impact-may2019-updated.pdf](https://www.usaid.gov/sites/default/files/documents/1864/investing-for-impact-may2019-updated.pdf). Accessed 10 Aug. 2021.
- 22 Ibid.
- 23 USAID Center for Innovation and Impact. "Unleashing Private Capital for Global Health Innovation: Innovator and Investor Support Opportunities." [usaid.gov/sites/default/files/documents/USAID_Private_Capital_508.pdf](https://www.usaid.gov/sites/default/files/documents/USAID_Private_Capital_508.pdf). Accessed 10 Aug. 2021.
- 24 Ibid.
- 25 Browner, Michaela. "How This Med Tech Startup Pivoted to Fight the Pandemic." *Global Citizen*. 8 Oct. 2020. [globalcitizen.org/en/content/how-this-med-tech-startup-pivoted](https://www.globalcitizen.org/en/content/how-this-med-tech-startup-pivoted). Accessed 27 Aug. 2021.
- 26 Jayakumar, PB. "Coronavirus: Trivitron to produce testing kits, ventilators, PPEs, hand sanitisers." *Business Today*. 4 Apr. 2020. [businesstoday.in/industry/pharma/story/coronavirus-trivitron-to-produce-testing-kits-ventilators-ppes-hand-sanitizers-253899-2020-04-04](https://www.businesstoday.in/industry/pharma/story/coronavirus-trivitron-to-produce-testing-kits-ventilators-ppes-hand-sanitizers-253899-2020-04-04). Accessed 27 Aug. 2021.
- 27 Unless otherwise cited, all source material from Endeavor Insight interview, as well as: Skanray Technologies. Skanray. com. Accessed 29 Sep. 2021.
- 28 Sindwani, Prerna. "Kiran Mazumdar Shaw wants the Modi government to buy more ventilators — she's even telling them where to shop and for how much." *Business Insider*. 21 Mar. 2020. [businessinsider.in/india/news/coronavirus-kiran-mazumdar-shaw-wants-the-modi-government-to-buy-more-ventilators-shes-even-telling-them-where-to-shop-and-for-how-much/articleshow/74747336.cms](https://www.businessinsider.in/india/news/coronavirus-kiran-mazumdar-shaw-wants-the-modi-government-to-buy-more-ventilators-shes-even-telling-them-where-to-shop-and-for-how-much/articleshow/74747336.cms). Accessed 10 Sep. 2021.
- 29 UL Health Sciences. "Industry Case Study: Skanray Technologies." skanray.com/sites/all/themes/corporateclean/images/UL%20Skanray%20Case%20Study.pdf. Accessed 29 Sep. 2021.

30 Healthcare Radius. "Re-defining Manufacturing. How various manufactures are ramping up ventilator production in a record-breaking time." 11 Jun. 2020. healthcareradius.in/technology/26307-re-defining-manufacturing. Accessed 10 Sep. 2021.

31 Das, Sohini. "Globalisation can't be done away with Swadeshi slogans: Skanray Tech chief." 26 May 2020. Business Standard. business-standard.com/article/companies/globalisation-can-t-be-done-away-with-swadeshi-slogans-skanray-tech-chief-120052500806_1.html. Accessed 10 Sep. 2021.

32 Healthcare Radius. "Re-defining Manufacturing. How various manufactures are ramping up ventilator production in a record-breaking time." 11 Jun. 2020. healthcareradius.in/technology/26307-re-defining-manufacturing. Accessed 10 Sep. 2021.

33 Asianet Newsable. "Google Pay rolls out new feature: Here's how you can consult doctors online for COVID-19." 17 May 2021. newsable.asianetnews.com/technology/google-pay-rolls-out-new-feature-here-s-how-you-can-consult-doctors-online-for-covid-19-ank-qt8ina. Accessed 1 Nov. 2021.

34 Endeavor Insight interview, Jul. 2021.

35 techcabal. "GovTech In Nigeria: From Regulatory Maze to Models of Good Practice." 27 May 2021. techcabal.com/2021/05/27/govtech-in-nigeria-from-regulatory-maze-to-models-of-good-practice. Accessed 27 Aug. 2021.

36 Unless otherwise cited, all direct quotes and company information from Endeavor Insight interview, Aug. 2021.

37 Odisha TV. "The journey of a start-up: Prantae Solutions." 1 Jun. 2018. youtube.com/watch?v=pWZ0nRp-cSc&t=4s. Accessed 10 Sep. 2021.

38 Ibid.

39 Ommcom News. "Odisha Start-Up Prantae Solutions Ties Up With Russian Giant To Co-Develop Point Of Care Diagnosis For Rheumatoid Arthritis." 13 Jun. 2021. ommcomnews.com/odisha-news/odisha-start-up-prantae-solutions-ties-up-with-russian-giant-to-co-develop-point-of-care-diagnosis-for-rheumatoid-arthritis. Accessed 31 Aug. 2021.

40 Murungi, Nelly. "Uganda's MamaOpe fast-tracks the diagnosis of pneumonia through smart jackets." 2 Jul. 2020. How we made it in Africa. howwemadeitinafrica.com/ugandas-mamaope-fast-tracks-the-diagnosis-of-pneumonia-through-smart-jackets/67890. Accessed 27 Sep. 2021.

41 Neopenda. "Annual Report 2016." 2017. neopenda.com/wp-content/uploads/2019/11/neopenda_annual_report_2016.pdf; "Annual Report 2017." 2018. neopenda.com/wp-content/uploads/2019/11/neopenda_annual_report_2017.pdf. Accessed 31 Aug. 2021.

42 Neopenda. "Annual Report 2017." 2018. neopenda.com/wp-content/uploads/2019/11/neopenda_annual_report_2017.pdf. Accessed 31 Aug. 2021.

43 Neopenda. "Annual Report 2018." 2019. neopenda.com/wp-content/uploads/2019/11/neopenda_annual_report_2018.pdf. Accessed 31 Aug. 2021.

44 USAID Center for Innovation and Impact. "Unleashing Private Capital for Global Health Innovation: Innovator and Investor Support Opportunities." usaid.gov/sites/default/files/documents/USAID_Private_Capital_508.pdf. Accessed 10 Aug. 2021.

45 Swildens, Hans & Eric Yee. "The Venture Capital Risk and Return Matrix." 7 Feb. 2017. Industry Ventures. industryventures.com/the-venture-capital-risk-and-return-matrix. Accessed 12 Aug. 2021.

46 Desai, Kartik & Aparna Dua, et al. "The India Impact Investing Story." Asha Impact & Impact Investors Council. Jun. 2020. ashaimpact.com/Admin/CMS/PDF/IIC%20Asha%20Impact%20Report_The%20India%20Impact%20Investing%20Story_June%202020.pdf. Accessed 10 Aug. 2021.

47 Disrupt Africa. "Africa Tech Startups Funding Report 2020." 2021. disrupt-africa.com/funding-report. Accessed 10 Aug. 2021.

48 ReliefWeb. "COVID-19 spurs health innovation in Africa." 29 Oct. 2020. reliefweb.int/report/world/covid-19-spurs-health-innovation-africa. Accessed 10 Aug. 2021.

49 Guttentag, Matthew & Abigayle Davidson, et al. "Does Acceleration Work? Five years of evidence from the Global Accelerator Learning Initiative." Global Accelerator Learning Initiative. May 2021. galidata.org/assets/report/pdf/Does%20Acceleration%20Work_EN.pdf. Accessed 28 Jul. 2021.

50 Department of Biotechnology, Ministry of Science and Technology, Government of India. "Vision and Mission." dbtindia.gov.in/about-us/vision-and-mission. Accessed 31 Aug. 2021.

51 Koshy, Jacob. "Budget 2020 | Cheer for science as key departments get a raise." The Hindu. 1 Feb. 2020. thehindu.com/business/budget/budget-2020-cheer-for-science-as-key-departments-get-a-raise/article30715689.ece. Accessed 31 Aug. 2021.

52 Nogrady, Bianca. "How Indian biotech is driving innovation." Nature. 12 Dec. 2018. nature.com/articles/d41586-018-07671-9. Accessed 31 Aug. 2021.

53 Biotechnology Industry Research Assistance Council. "Annual Report 2015-16." 2017. birac.nic.in/webcontent/BIRAC_English_Annual_Report_10_04_2017.pdf. Accessed 31 Aug. 2021.

54 Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government of India. "Startup India: The Way Ahead." 2021. startupindia.gov.in/content/dam/invest-india/Templates/public/Startup_India-Way_Ahead.pdf. Accessed 31 Aug. 2021.

- 55 Startup India. "About Startup Portal." startupindia.gov.in/content/sih/en/about_startup_portal.html. Accessed 31 Aug. 2021.
- 56 Nogrady, Bianca. "How Indian biotech is driving innovation." *Nature*. 12 Dec. 2018. nature.com/articles/d41586-018-07671-9. Accessed 31 Aug. 2021.
- 57 Stanford-Byers Center for Biodesign. "Stanford-India Biodesign." biodesign.stanford.edu/programs/global-initiatives/stanford-india-biodesign.html. Accessed 31 Aug. 2021.
- 58 Department of Biotechnology, Ministry of Science & Technology, Government of India. "Celebrating Biotechnology: Building India as an Innovation Nation." 2019. [dbtindia.gov.in/sites/default/files/DBT_Report_R2V6_250219%20\(1\).pdf](http://dbtindia.gov.in/sites/default/files/DBT_Report_R2V6_250219%20(1).pdf). Accessed 31 Aug. 2021.
- 59 Unless otherwise cited, all source material from MediBuddy. MediBuddy.in. Accessed 29 Sep. 2021.
- 60 Rai, Joseph. "Podcast: DocsApp's Satish Kannan on journey from incubation to merger with Medibuddy." *VC Circle*. 14 Aug. 2020. vccircle.com/podcast-docsapp-s-satish-kannan-on-journey-from-incubation-to-merger-with-medibuddy. Accessed 7 Sep. 2021.
- 61 Ibid.
- 62 Ibid.
- 63 Ibid.
- 64 Ibid.
- 65 Khatri, Bhumika. "DocsApp Acquires MediBuddy, Joint Entity Scores \$20 Mn In Series B Funding." *Inc42*. 4 Jun. 2020. inc42.com/buzz/docsapp-acquires-medibuddy-joint-entity-scores-20-mn-in-series-b-funding. Accessed 31 Aug. 2021.
- 66 Asianet Newsable. "Google Pay rolls out new feature: Here's how you can consult doctors online for COVID-19." 17 May 2021. newsable.asianetnews.com/technology/google-pay-rolls-out-new-feature-here-s-how-you-can-consult-doctors-online-for-covid-19-ank-qt8ina. Accessed 31 Aug. 2021.
- 67 Haidar, Faizan. "Managed office space provider Smartworks ties up with MediBuddy for healthcare facilities." *The Economic Times*. 6 May 2021. economictimes.indiatimes.com/industry/services/property/-/cstruction/managed-office-space-provider-smartworks-ties-up-with-medibuddy-for-healthcare-facilities/articleshow/82433336.cms. Accessed 2 Sep. 2021.
- 68 iungo capital. "Our Impact." iungocapital.com/ourimpact. Accessed 31 Aug. 2021.
- 69 Artha Impact. arthaimpact.com. Accessed 31 Aug. 2021.

Photo Credits

p. 9 photo courtesy of 54gene

p. 13 photo courtesy of CarePay

pp. 15-17 photos courtesy of Skanray Technologies

pp. 20-21 photos courtesy of Helium Health

p. 23 photo courtesy of 54gene

p. 24 photo courtesy of Prantae Solutions

p. 25 photo courtesy of MamaOpe Medicals

p. 29 photo courtesy of 54gene

pp. 34- 35 photo courtesy of Skanray Technologies

pp. 36- 37 photos courtesy of MediBuddy

Attribution

The content of this report, including all text and graphics, are licensed under the Creative Commons Attribution-NoDerivatives 4.0 International License.

Users are free to: Share — copy and redistribute the material in any medium or format for any purpose.

Under the following terms:

Attribution — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

No Derivatives — If you remix, transform, or build upon the material, you may not distribute the modified material.

No Additional Restrictions — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

