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Scale & Sustainability Report

Grand Challenges Canada®
Grands Défis Canada

BOLD IDEAS WITH BIG IMPACT™

Table of Contents

Executive Summary

Since 2010, Grand Challenges Canada (GCC) has supported global health innovators to develop their ideas and transition innovations to scale, by providing targeted funding and support. To date, GCC has funded more than 1,500 innovations at the proof of concept stage, and 270 innovations at the Transition-to-Scale (TTS) stage.

In 2022, GCC embarked on a learning initiative to assess the scale and sustainability of innovations that received Transition-to-Scale funding over the previous ten years. Through in-depth interviews with 49 TTS innovations, we found that over one third (38%) of GCC-supported innovations continue to sustain and grow their impact in the years after GCC funding has ended. The flexibility of GCC's funding and support enables innovators to build a solid foundation capable of sustaining and scaling impact.

Innovations with local leadership were more likely to sustain or increase impact over the long-term. By providing funding and organizational development opportunities for innovations located in low- and middle-income countries (LMICs), GCC fills a critical gap and removes a significant barrier to sustainable scale for innovators closest to the challenges.

Interview participants shared key enablers and barriers to scale and provided examples of how the enablers and barriers had played out for their innovation.

Photo Source: PSI

The most common enablers to scale:

- GCC's catalytic funding
- Strong partnerships
- Strong team capacity
- Strong stakeholder relationships
- Government interest in the innovation
- GCC's technical support
- Connections facilitated by GCC
- GCC's flexible funding and support

Most common barriers to scale:

- Challenges raising funds or generating investment
- Lack of demand or market fit
- COVID-19 pandemic
- Political instability or conflict
- Insufficient evidence generation
- Insufficient funding from GCC to achieve milestones for scale
- Timeframe for the GCC funding was insufficient to achieve milestones for scale
- Difficulty obtaining government buy-in or integrating into the healthcare system

The insights on the enablers and barriers to scale for innovators working in LMICs have been used to inform GCC's Scale and Sustainability Action Plan and Strategy, with a goal of supporting TTS innovators to achieve milestones on their journeys to scale and sustainability through funding, tailored technical support, and networks.

This report provides an overview of the findings from the learning initiative and includes several case studies to illustrate how innovations are progressing towards scale and sustainability, and GCC's role in helping innovations navigate scaling barriers.

Background

As one of Canada's largest impact-first investors, Grand Challenges Canada (GCC)'s ultimate goal is to support innovative solutions to have a long-lasting and widespread impact among under-served and unserved individuals in the communities where they work. GCC defines impact as the number of lives improved (through measurable improvements in health or wellbeing) and the number of lives saved (through measurable reductions in mortality).

To achieve this, GCC has developed a unique innovation platform that supports innovators and entrepreneurs to:

1. Test their ideas with small, short-term seed funding grants;
2. Build their capacity to transition their innovation to scale with flexible, concessionary funding and bespoke technical support through the Transition-to-Scale program.

GCC's Transition-to-Scale (TTS) program was launched in 2011, and had funded more than 270 innovations by 2023, in addition to the 1,200 innovations funded at the seed / proof of concept stage. In the first twelve years of the TTS program, GCC-funded innovations collectively saved more than 62,000 lives and improved the lives of more than 21 million people.

This impact will continue to grow as the innovations mature and reach scale, and GCC estimates that the innovations its funded at TTS could improve up to 64M lives by 2030.

One of the most significant challenges in measuring the impact and scale of innovations is the length of time required for most innovations to reach their full potential. Some innovations may achieve impact at scale in the short term (within five years), while many achieve scale in the medium or longer term (10 to 15+ years). All these timelines to impact at scale extend beyond the lifetimes of GCC's funding, making it difficult to assess scaling success.

GCC has funded innovations at the TTS stage for more than a decade, and with the growing maturity of the TTS portfolio we wanted to learn more about long-term scale and sustainability outcomes. Through the learning initiative, we set out to determine if GCC-funded innovations are continuing to achieve impact, and if so, how widely impact is being scaled. We also set out to learn more about their scaling journeys, and to understand how we can best support innovators going forward.

Scale & Sustainability

The International Development Innovation Alliance (IDIA) defines scaling as "the process of replicating and/or adapting an innovation across large geographies and populations for transformational impact." Sustainable scale is defined as "the wide-scale adoption of an innovation or approach at a desired level of growth, sustained by an ecosystem of actors". [1]

Ideation

Defining and analyzing the development problem and generating solutions through horizon scanning of existing and new ideas

Research & Development

Further developing specific innovations that have potential to address the problem

Proof of Concept

When the intellectual concept behind an innovation is field tested to gain an early, 'real-world' assessment of its potential

Transition to Scale

When innovations that have demonstrated small-scale success develop their model and attract partners to help fill gaps in their capacity to scale

Scaling

The process of replicating and/or adapting an innovation across large geographies and populations for transformational impact

Sustainable Scale

The wide-scale adoption of operation of an innovation at the desired level of scale / exponential growth, sustained by an ecosystem of actors

GCC's goal is to provide the right mix of support at the proof of concept (e.g., field testing) and TTS (e.g., iteration and development) stages so that innovators build the capacity to achieve transformational impact and sustainable scale in the future, after GCC funding ends.

Methodology

The objectives of the Scale & Sustainability Learning Initiative were to evaluate scale and sustainability of innovations supported at TTS and identify enablers and barriers to scale.

GCC's Knowledge Management & Translation Team led the development of the methodology, with input and guidance from the Program Advisory Council, and senior leadership. We convened an internal Learning Group on Scale and Sustainability to draw on the GCC teams' experiential knowledge of supporting innovations to transition to scale. The Learning Group met throughout the learning initiative to co-create the methodology, discuss emerging insights and results, and provide input on how to put the findings into action.

Through an initial landscape analysis, we found Duke University's Launch and Scale Framework [2] to be most informative for shaping our methodology. We partnered with The Duke Global Health Innovation Center to develop data collection tools, and they supported data collection and analysis, drawing from their unique expertise in assessing milestones for scale and sustainability.

Primary data collection took place from July – October 2022, and was carried out through in-depth, semi-structured interviews with 49 TTS innovations whose GCC funding had come to an end between 10 months and 8 years prior to analysis, drawn from a random sample of closed TTS innovations in the Global Health Innovation portfolio (n=175) [3]. The interview sample was representative of the Global Health Innovation TTS program in terms of portfolios, geographic distribution, institution type and scaling pathway (within an acceptable margin). We achieved thematic saturation with this interview sample.

Recognizing that there might be biases in the responses to questions about GCC's support during the interviews, respondents were also sent an anonymous feedback survey where they had the opportunity to provide additional reflections and suggestions about GCC's support.

Interview respondents were asked to complete a follow up quantitative survey to gather more precise data on the time and resources required to scale. Low response rates limited the utility of the findings and the results are not reflected in our analysis.

Limitations

When we compared respondents and non-respondents by their scaling status at the end of TTS funding, we found that non-respondents were more likely to have been classified as "failed to scale" than respondents (24% and 6%, respectively), which indicates that our sample is biased towards successful innovations. To mitigate this bias, we widened the sample and randomly selected additional innovations to participate but were not able to substantially increase the proportion of participants that had "failed to scale". This bias is acknowledged in the results and the conclusions.

Study Participants

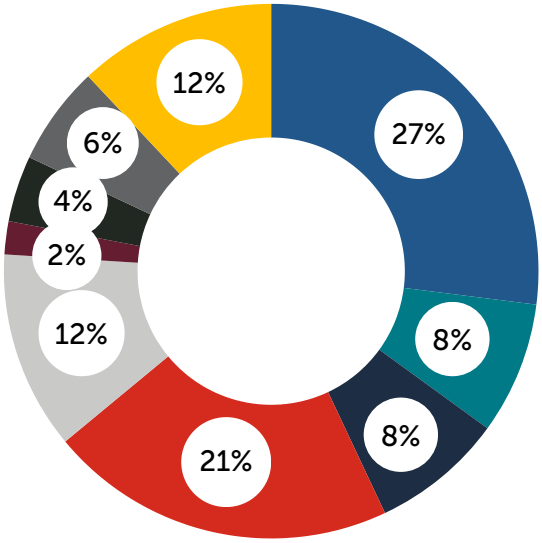
The interview participants were representative of the Global Health Innovation TTS program in terms of portfolios, geographic distribution, institution type, scaling pathway, and institutional risk (within an acceptable margin).

Figure 1.1 - Interview Respondents by Institution Region

Figure 1.2 - Interview Respondents by Implementation Region

Figure 1.3 - Responses by Portfolio

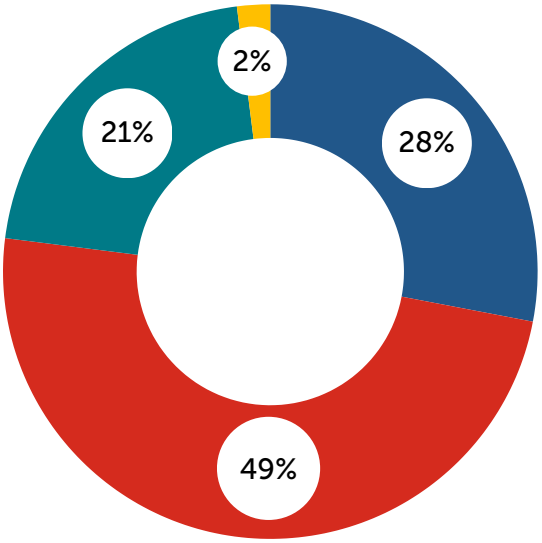
- Maternal and Newborn Health
- SRHR
- Sanitation
- Global Mental Health
- Saving Brains
- Communicable Diseases
- Assistive Devices
- Diagnostics
- Medical Products & Technologies



Interview Respondents (N = 49)

Figure 1.4 - Responses by Institution

- Academic/Research
- Other
- For Profit
- Not-for-profit



Interview Respondents (N = 49)

All participants had been funded through GCC's TTS program, and 62% had also been funded at Seed by GCC or a close partner (i.e., they were sourced through the Every Woman Every Child Innovation Marketplace or Saving Lives at Birth platforms).

The average length of time since the end of GCC's TTS funding was four years.

Innovations per Length of Time Since End of GCC's TTS Funding

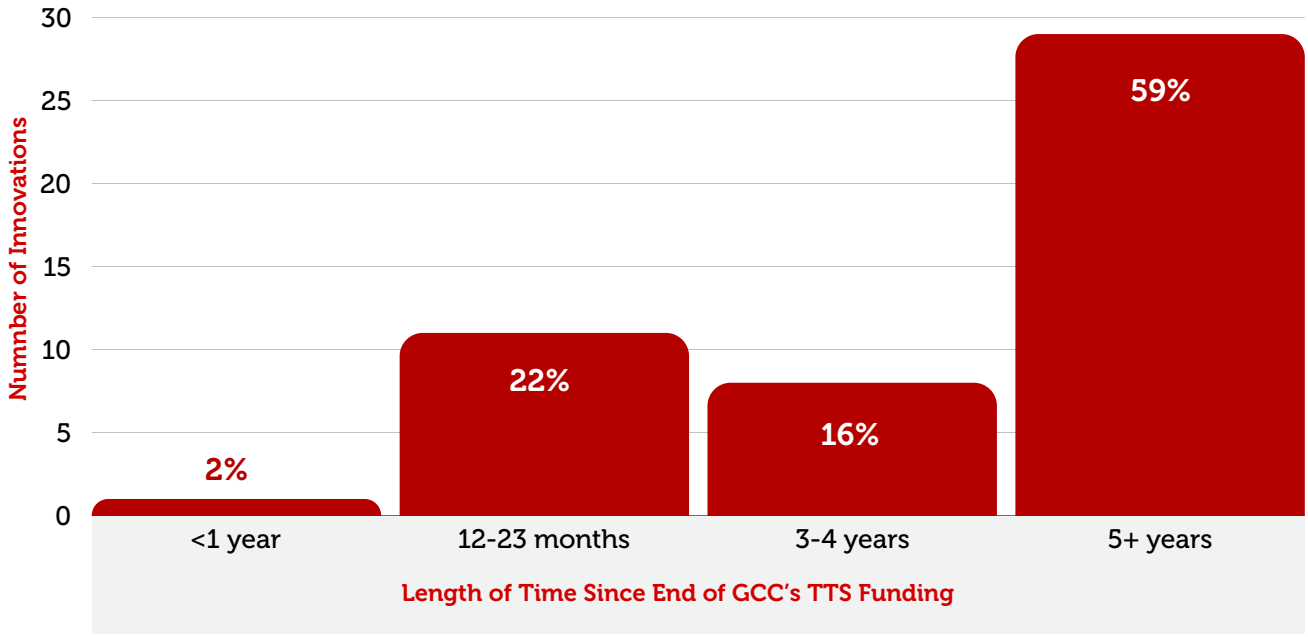


Photo Source: PSI

Key Findings

1) Over one third (38%) of GCC supported innovations continue to sustain and grow their impact in the years after GCC's funding and are on track to achieve financial sustainability.

- Up to 2% of innovations were assessed as "challenge addressed", as they had scaled across the intended geographies and addressed the challenge, with sustained impact. The GCC-funded institutions had successfully exited and handed over the innovation to other implementation partners, which were providing long-term sustainability. This included government partners (i.e., Ministry of Health) or private sector partners (i.e., the innovation was sustainable through existing distribution and retail channels).

- Almost a quarter (24%) of innovations were assessed as "increasing impact", as they had expanded into new geographies (i.e., new municipalities, regions, or countries) and/or had substantially increased overall implementation capacity by training additional health care workers or service providers to deliver the innovation (i.e., 100+ service providers had been trained, reaching 1,000+ patients/customers).

- A total of 12% of innovations were assessed as "sustaining impact", as they were implementing at approximately the same number of facilities/sites and had roughly the same overall implementation capacity as during their TTS funding.

- Some innovations (8%) were not able to sustain the impact achieved during the TTS funding.

- This finding conservatively assumes that all 57 innovators who declined or did not respond to the request to participate in an interview had not sustained their impact after GCC funding ended.

Category	N	%
Challenge addressed	2	2%
Increasing impact	25	24%
Sustained impact	13	12%
No impact	9	8%
No response /decline	57	54%
Total	106	100%

Recognizing the many challenges that innovators and entrepreneurs face when scaling innovations in LMICs, GCC expects that 30% of innovations funded at TTS will scale and sustain impact over the long-term. The results of this learning initiative indicate that GCC is on track to achieve this target.

Innovations Amplifying Impact: Case Studies and Insights

Assist International

- Assist International enhances medical oxygen access in under-resourced areas by constructing and managing oxygen facilities, and offering training and equipment maintenance.
- During the GCC funding (2017 - 2021) they built two large-scale PSA oxygen facilities in Ethiopia, serving 127 hospitals, and secured funding to build a third.
- In the year after GCC funding ended, they built one oxygen plant in Kenya, supplying 100 hospitals with medical grade oxygen, and have secured funding to build 4 additional oxygen plants in Ethiopia.

Friendship Bangladesh

- Friendship Bangladesh provides comprehensive healthcare delivery and education to isolated, river-based and coastal communities in Bangladesh.
- GCC funding (2019 – 2021) helped them expand their outreach and training to engage 220 Community Health Workers in micro-entrepreneurship activities.
- In the year and a half after the GCC funding, they expanded the training to an additional 460 Community Health Workers.

Fyodor Biotechnologies

- Fyodor Biotechnologies developed a urine malaria test that can easily be self-administered at home, with results ready in less than half an hour.
- During the GCC funding (2018-2020), they focused on laying the groundwork to have the test integrated into Nigeria's national malaria guidelines to facilitate widespread adoption nationally.
- During the funding, 1,200 healthcare providers prescribed and distributed 120,000 tests, and social media advertising led to the distribution of 49M tests across Nigeria. In the two years since the end of GCC funding, Fyodor expanded into Cote d'Ivoire, distributing 100,000 malaria tests, reaching an estimated 20,000 households.

LifeNet Malawi

- LifeNet Malawi's healthcare delivery approach works with healthcare facilities to rapidly incorporate improvements in the quality of care for women and children's health.
- GCC's funding (2019-2020) helped them test a new way to implement their intensive training program and shift it to a centralized model.
- During the GCC funding, LifeNet expanded to 113 health facilities across Burundi and the Democratic Republic of Congo, and have expanded to an additional 37 facilities in the two years since GCC funding ended.

2) Over one-third (37%) of innovations supported at TTS have achieved financial sustainability to sustain or grow their innovation.

- Up to 6% of innovations had achieved long-term financial sustainability, through partial or full hand over to other partners, such as governments or private sector retailers.
- A total of 31% reported that they had secured enough funding to sustain or increase impact for about one year. The majority of these innovations were largely still dependent on donor funding, and in some cases, revenue or private sector investments also contributed to financial sustainability.
- Almost one-quarter (20%) of interview respondents indicated they had struggled to raise enough funds to maintain impact.
- As with the impact results above, this finding conservatively assumes that all 57 innovators who declined or did not respond to the request to participate in an interview had not sustained their impact after GCC funding ended.

3) Innovations with local leadership are more likely to sustain or increase impact post-GCC funding.

- Of the 40 innovations that reported sustaining or increasing impact, 80% had a local founder and/or leadership.
- Of the nine innovations that reported no impact, only 66% had local leadership.
- By providing funding and organizational development opportunities for LMIC-based innovators,

GCC fills a critical gap and removes a significant barrier to sustainable scale for innovators closest to the challenges.

Financial Sustainability	N	%
Long-term financial sustainability through handover	6	6%
Funding secured to sustain or increase impact for ~1 year	33	31%
Not enough funds to sustain impact	10	9%
No response	57	54%
Total	106	100%

Examples of innovations that are scaling impact and have achieved financial sustainability:

Jhpiego

- The low-dose, high-frequency training model was originally used to train health providers to address postpartum hemorrhage and birth asphyxiations, and later pivoted for use in other disease areas, including HIV, TB, post-abortion and family planning.
- The innovation is an example of a successful exit as it is scaling throughout Uganda through the Ministry of Health and other NGO implementers, such as UNICEF.

JSI Cord Care

- The use of chlorhexidine for umbilical cord care scaled nationwide in Nepal during JSI's Saving Lives at Birth (SL@B) award and is an example of a successful public sector exit. They achieved 100% nationwide coverage in 2017 and have sustained their implementation in all 75 districts of Nepal, reaching all public health facilities and 79 private health facilities.
- The successful exit of this innovation is attributable to the hire of a project lead with prior expertise liaising with government partners, and strong evidence demonstrating the reduction of neonatal mortality from chlorhexidine use.

Queen's University/WEMA Inc.

- The innovation is an integrated platform called Servical, that provides training to improve cervical cancer screening services, improved treatment of small and large lesions, and ongoing support and monitoring. During the GCC funding, they refined the app and worked on scaling across Tanzania in partnership with the Ministry of Health.
- Since the end of TTS funding in 2016, the Tanzanian Ministry of Health has fully integrated Servical into the National Health System Cervical Cancer Prevention Program. The researchers from Queen's University have remained involved to support further research and scale.
- In Tanzania they are part of a large-scale cervical cancer screening trial using HPV self-sampling technology. Partnerships have been developed with organizations in Rwanda, Kenya, and Lesotho, and plans are underway to expand Servical in each of these three countries.

4) Public sector scaling pathways were more likely to see innovations sustaining or increasing their impact.

- Higher success rates were seen across the Saving Brains, Sexual and Reproductive Health and Rights, and Global Mental Health portfolios, which are primarily made up of innovations on public sector scaling pathways. Many of these portfolios are more mature; participants noted that building and sustaining government partnerships and buy-in can be a lengthy and resource-intensive process.

- There was a high success rate among the innovations in the interview sample, with 82% continuing to scale impact after GCC funding. Looking at those that were not having impact, we found that innovations pursuing private sector or hybrid paths had a higher rate of reporting no impact after GCC funding – 30% and 20% respectively, compared to 5% of innovations on a public sector scaling pathway. Innovations on a private sector or hybrid pathway reported challenges with market fit and generating sufficient demand in low-income markets to make the financial model work and in securing funding after GCC funding was finished.

5) Flexibility in GCC's funding and support enables innovators to build a solid foundation capable of sustaining and scaling impact.

- GCC's willingness to fund early-stage innovations and offer flexibility on types of activities and milestones used for to measure innovations' progress towards scaling.

- GCC's technical assistance helps innovators to build their capacity and to achieve key milestones and activities to lay the groundwork for further scaling. This includes capacity-building in business development, partnership development and engagement, monitoring and evaluation, and a range of other related topics.

- Smart partnerships are a key enabler to scale, as they bring additional financial, technical and strategic support. GCC's flexible support enables innovators to invest time and energy in building trusting relationships, which is necessary for successful, long-term smart partnerships.

Empowering Progress: Testimonials on GCC's Impactful Support and Funding

"[GCC's] venture advisory support is very critical for many projects that would not otherwise have access to this support."

"GCC staff are very hands-on with technical assistance, which was the most valuable thing – to have a Program Officer who was always available and committed."

In terms of experimenting with the education and door-door model, it wouldn't have been possible without GCC funding…GCC support was instrumental in developing a few programs."

Enablers & Barriers of Scale

Enablers of Scale

Interview respondents were asked to "tell us about the key enablers or factors that have contributed to your innovations' success" and were encouraged to discuss multiple enablers and provide examples, but were not prompted specifically to discuss any particular theme. The most common enablers — including those within and outside of GCC's support — are summarized below, along with quotes from interview participants to illustrate how these enablers impacted their innovations:

1) GCC's funding was catalytic (21 responses, 42% of respondents)

GCC funding was crucial for early-stage innovations, which had limited access to funding from other sources because they were at too early a stage. Innovators used GCC funds for key activities to validate and/or de-risk their innovation (e.g., testing and iterating on the product/prototype, testing their business model, generating evidence, etc.) which they believed helped bring in other funders, and position them for further progress and success. GCC's support for generating evidence helped innovations achieve a key milestone that led to further progress and scaling.

2) Strong partnerships for implementation (18 responses, 37% of respondents.

Interview participants spoke about the importance of strong partnerships (with implementation partners) in enabling scale and sustainability, which were characterized as follows:

- Alignment of mission and values is essential for successful partnerships.
- Trusting relationships between partners is critical; trust means that partners are mutually listening to one another, and then act on what they are hearing from their partners. Recognition and appreciation of the work of partners is also an important component of building trusting relationships.
- Each partner needs to have a clear value-add that they bring to the work.
- Shared decision-making is essential to secure buy-in and ownership of partners; for government partners, the decision-making needs to sit within the government.
- Shared learning can help secure buy-in and ownership of partners.
- Ongoing work is required to continually develop new partnerships and/or nurture existing partnerships.

“

[Saving Lives at Birth] was an important program for us and our work, and the funding plugged such a gap in the work. Even though there is a lot of talk about supporting translational work, it is very hard to get funding for it... When you have a public good in a global setting it's hard to attract investors, and you get stuck in a 'no man's land.

3) Strong team capacity (15, 31% of respondents)

A strong team with a range of necessary skillsets for scaling ensures that the organization can manage growth effectively, maximizing its potential for scale and sustainable impact. This includes fundraising, partnership development, government engagement, project management, project design and implementation, and stakeholder engagement. Scaling needs evolve as an organization grows, and the leaders must respond to capacity gaps by either hiring individuals with the needed expertise or training the staff to develop the skills. Cultivating a reputation for expertise increases credibility among partners, stakeholders and end-users, which helps drive demand and establish trust.

4) Ongoing, meaningful stakeholder relationships (12, 24% of respondents)

Strong relationships with community stakeholders (i.e., organizations and individuals with interest in or influence over the outcomes) are essential for fostering collaboration, trust, and the sharing of resources. Interview participants spoke about taking the time to really understand the needs of different stakeholders and the importance of frequent communication that provides stakeholders with an opportunity to provide feedback, and the importance of integrating the feedback into programming.

"GCC staff are very hands-on with technical assistance, which was the most valuable thing – to have a Program Officer who was always available and committed."

5) Government interest (12, 24% of respondents)

Government interest and engagement has been a key enabler of scale for innovations on a public sector, as well as those on a private sector or hybrid pathway. Interview participants shared some of the approaches that had led to meaningful government engagement:

- Alignment with government priorities is key in sparking interest from government that leads to integration and uptake.
- Working with champions and advocates within government, who can help navigate through the politics and bureaucratic processes.
- Generating strong evidence to demonstrate how the innovation will help government achieve their priorities.
- Government engagement and policy influence require long-term relationship-building.

6) GCC's technical support (11 responses, 22% of respondents)

GCC provides tailored technical support to TTS funding recipients, to ensure that they build the necessary capacity to effectively transition their innovations to scale. Both external venture advisors and internal GCC support were helpful to innovators, as were the communities of practice that GCC organized.

7) Connections facilitated by GCC (11 responses, 22% of respondents)

GCC provided valuable connections to:

- Strategic advisors to support innovation development and implementation;
- Other innovators, which then led to partnerships forming
- Other funders

Communities of practice were valuable as the meetings/events helped to foster organic connections between innovators. This often resulted in increased growth for innovations through information sharing, mentorship, partnerships and collaboration.

"GCC facilitated partnerships by connecting us to people who could provide strategic advice and they provided linkages to other funders."

"The right mix of people and events, [created] an organic situation that facilitated our growth."

8) GCC's flexible funding and support (9 responses, 18% of respondents)

GCC flexible funding enabled testing and iterating, which other funders are not interested or willing to fund. The outcomes of the testing and iterating are important in helping innovators make improvements, including increased cost-effectiveness and faster, more efficient implementation. External challenges, including COVID-19, also required further iteration and pivots for many innovations, and GCC offered the flexibility to make those pivots, such as integrating digital components into existing, proven interventions.

9) Evidence of effectiveness (7 responses, 14% of respondents)

Strong evidence is critical in building a compelling case for the innovation's success and helps garner support from stakeholders and attract additional funding. Evidence can come in different forms, depending on what the partners and funders need; in some cases, Randomized Control Trials provide the necessary evidence but, in other cases cost-effectiveness data, or qualitative research was effective in convincing stakeholders about the impact of the innovation.

"We got support on how to be flexible and keep correcting the project and improving it, and there were no restrictions from GCC's side."

"We also developed an evaluation; [it was] participatory, you don't analyze and interpret – you present raw data and use sense-making to analyze it together. This was a big enabler, because instead of passively digesting [results], they had to understand what was going on, what's working or not working all the way, and this informed changes to community health strategy."

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> **GCC facilitated partnerships by connecting us to people who could provide strategic advice and they provided linkages to other funders.**

Photo Source: Lwala

Barriers and Delays to Scale

Interview respondents were asked to "tell us about challenges and barriers you've experienced in scaling your innovation" and were encouraged to discuss multiple different barriers and provide examples but were not prompted specifically to discuss any particular theme. The most common barriers – including barriers within and outside of GCC's support – are summarized below, along with quotes from interview participants to illustrate how these barriers impacted their innovations:

1) External funding limitations were a barrier for achieving key milestones (20 responses, 41% of respondents), and manifested in the following ways:

- Fundraising was challenging for innovations whose focus area was not well aligned with donor funding priorities (e.g., oxygen [prior to COVID-19], childhood illness, infant resuscitation), which made it difficult to raise funds to continue their transition-to-scale work after GCC funding. This was exacerbated due to COVID-19, with many donors prioritizing pandemic response over other health areas.

- Innovators felt pressure to pivot their activities to better align with funding opportunities, which sometimes pulled them away from their original mission.

- There were fewer funding opportunities for organizations or entities from LMICs, as donors preferred to fund international organizations.

- For innovations pursuing a private sector scaling pathway, it was difficult to find investors who were interested in investing LMIC-based entities or for innovations implementing in LMIC markets.

- Funding opportunities for early-stage innovations were also limited, as many donors prefer to fund implementation activities rather than early-stage activities and milestones, such as research, evidence generation, product testing and development, and partnership development and advocacy.

2) COVID-19 as a barrier to scale (14, 29% of respondents)

Roughly one third of respondents listed COVID-19 as a barrier to scale although, for many of them, it played out as a delay rather than a long-term barrier that prevented progress. COVID-19 impacted innovations in the following ways:

- Shifts in funding priorities, resulting in a loss or reduction of funding

- Shifts in government policy priorities, resulting in government commitments for resources, funding and support not coming to fruition

- Impacts to the healthcare system (i.e., shutdowns, reduced staff), resulting in reduced patient access to the care networks that innovations were implementing through

- Mandatory shutdowns or restrictions in travel delayed plans for training, implementation, research and data collection, stakeholder meetings, and other key activities.

It is important to note that COVID-19 did not have a significant negative impact on all innovations, and, for some, it provided new opportunities for adaptation and scaling, including those providing medical oxygen which were able to expand due to increased oxygen demand, and those that were able to adapt their innovations to support COVID-19 testing.

3) Lack of demand or market (9 responses, 18% of respondents)

For some innovations, it was difficult to make the financial model work where the demand for the product was too low and manufacturing costs too high to make it financially viable.

"The market was never there to buy the device with the cost that would have been needed."

4) Political conflict and instability (7 responses, 14% of respondents)

Implementation in conflict-affected areas poses risks to staff, despite the clear need for innovative interventions. Conflict in other areas with externalities affected innovation implementation (e.g., rising prices of fuel or disruption in the availability of materials in the supply chain). Political instability and changes in government disrupt the partnerships and relationships that innovators have established and require them to start over with a new administration and personnel.

5) Insufficient evidence generated (6, 12% of respondents)

The need to generate more or stronger evidence created delays for some innovations, and for some, a significant pivot was required to improve the effectiveness of the innovation.

6) GCC's funding amount was not sufficient for achieving key milestones (5 responses, 10% of respondents)

For some innovations, at the end of TTS they felt they had insufficient funds to achieve what they believed were key milestones on their pathway to scale (e.g., policy change), or they had financing needs that were not eligible under GCC funds (e.g., CAPEX costs), which made it difficult for them to reach bottom-of-pyramid populations.

7) GCC's funding amount and timeline were not sufficient for achieving key milestones (5 responses, 10% of respondents)

For some innovations, the timeframe for spending funds was too short; they would have benefitted from more time to spend the funds and work on project activities. Some smaller organizations did not have the internal capacity to spend ~$1M over one to three years.

8) Difficulty obtaining government buy-in (5, 10% of respondents)

Challenges with securing government buy-in have played out in the following ways for GCC-funded innovations:

- Strong foundational relationships with government partners are required for public sector scaling, which take time and resources to build.
- High turnover of government officials was noted as a challenge for maintaining partnerships and buy-in.
- Depending on the health sector and type of innovation, the government may require additional research or integration into WHO guidelines as a benchmark for being able to support widespread use of innovations, which requires additional time and resources to achieve.
- Shifting government priorities and changing expectations around shared responsibilities are particular challenges related to scaling through the public sector.
- Limited health budgets make it challenging for governments to add new innovations into the health system.

9) Difficulty integrating into healthcare systems (5, 10% of respondents)

This is a particular challenge for medical products and technologies, and for innovations with non-local leadership (four out of five respondents who discussed this challenge are from institutions are not based in the implementing region).

Challenges with integrating into the healthcare system have played out in the following ways for innovations:

- Navigating government systems can be a lengthy and resource-intensive process, especially if there are multiple different governments or departments involved, with different systems and processes.
- Cost is a frequent barrier for uptake, and there is a need for on-the-ground partners that have the resources to carry out implementation if the government cannot absorb it.
- Health systems that rely on Community Health Volunteers (CHVs) face a structural funding issue where the CHVs are relied upon to implement universal health coverage, with limited resources and bandwidth to implement new/additional interventions.

Action Plan and Next Steps

The findings of the Scale & Sustainability Learning Initiative were used to inform an Action Plan, which has four specific goals:

Goal 1: Deepen tailored technical support for all TTS innovators with an expressed need

GCC's technical support (i.e., Community of Practice platforms, M&E, external venture advisors) was lauded as a key enabler to scale by innovators who participated in the portfolio review. It is clear, however, from the barriers to scale identified both within and external to GCC's support, that there is room for improvement in the coverage and type of venture advisory support that GCC provides. This is especially the case in areas such as fundraising, business development, and demand generation. There is also an opportunity for GCC to shift its support closer to innovators' locations, with many innovators expressing interest in working with local industry experts who have knowledge of local markets and actors. Lastly, GCC can do better at clarifying the type and amount of venture advisory support that is available at any given time and for each innovation.

Goal 2: Develop and implement portfolio approach to managing closed innovations

Closed innovations contribute significantly to GCC's impact metrics. The results of the learning initiative demonstrate how important it is to continue to engage with and learn from innovations whose funding has come to an end.

Taking a systematic approach to learn from and support closed innovations will allow us to clarify short- to medium-term opportunities where GCC can amplify enablers and address barriers for innovations based on lessons from their scaling journeys.

Goal 3: Develop simplified metrics for scale and sustainability for TTS innovators

The portfolio review results suggest that there is an important opportunity for GCC to better and more clearly define metrics to measure progression of TTS innovators along the scale and sustainability journey.

For example, a benefit of this approach would introduce the ability to right-size funding amounts to timelines necessary to achieve milestones, in a way that addresses key barriers to scale.

Goal 4: Engage the wider innovation ecosystem on the scale and sustainability results

We hope that others in the innovation and impact investing sectors find these results useful in informing and enhancing early-stage innovation support.

There is little research on scaling innovation from other innovation funders, and we hope this learning initiative inspires others to gather information on scaling and sustaining innovations, and to be transparent about scaling successes and failures.

Case Studies

The following case studies are drawn from the interviews with innovators who graciously shared their time and reflections with GCC, to illuminate the barriers and wins they have faced in their journeys to scale. These case studies have been selected to show the ranges of possibility in scaling goals and journeys that innovators encounter – from a sanitation innovation that has helped reduce open defecation through a market-based approach in rural Bihar, India, to a handheld diagnostic tool that was unsuccessful in reaching international scale.

Together, these four case studies illustrate the unique challenges in scaling health innovation in regional, national, and international contexts, and provide a frame of reference for the time required to build the relationships and conditions necessary for widespread scale. These stories also provide a window of insight into the gaps in support innovators face, and the role international and government actors play in facilitating scale.

Case Study: Aga Khan University (AKU), Pakistan & Harvard University, USA

Scaling Up Youth-Led Early Childhood Care and Education

The Challenge

With an estimated 22.8 million children aged 5-16 not attending school, Pakistan ranks second globally for the highest number of out-of-school children. [4] Children face many barriers to school attendance, including poverty, insufficient government investment in education, and a lack of early childhood educational opportunities to prepare children for school.

Children from low-income and vulnerable households reap the greatest benefits from quality early childhood care and education (ECCE) to prepare them for school, [5] yet only 19% of Pakistani children have access to ECCE programs. [6]

The Innovation

Aga Khan University (AKU), Pakistan in partnership with Harvard University, developed the Scaling Up Youth-Led Early Childhood Care and Education (LEAPS) program as an innovative cross-generational approach to support the learning and development of young children (3.5- to 5.5-year-olds) and young women (18- to 24-year-olds) in rural Sindh, Pakistan.

The program provides vocational training to young women, known as Community Youth Leaders (CYLs), who then deliver a community-based preschool program and carry out community engagement activities to stimulate local demand for ECCE.

GCC's Investment

- Seed funding for $250K [7] from 2014 – 2016
- Transition to scale funding for $1M from 2018 – 2021
- Co-funding from Dubai Cares for $2.8M

Scaling Pathway

Public Sector, through the National Commission for Human Development (NCHD), with co-funding

Scaling Status

Sustained impact

Scaling Journey

GCC's seed funding supported AKU to carry out an evaluation of the innovation's impact across 10 communities in Sindh. The study demonstrated significant improvements in early childhood development and school readiness, including working memory, inhibitory control, motor skills, literacy, social-emotional and self-regulation skills. The study also found that the LEAPs program empowered the CYLs by increasing their self-confidence and independence. The opportunity to earn an income was also significant, as many of the CYLs were the first women in their families to earn an income outside the home.

The study sparked interest from the NCHD, who were interested in implementing the program to address ECCE needs across the 30 districts in Sindh, but wanted to see evidence that this locally-driven program would continue to have impact at a larger scale.

With Transition to Scale funding, AKU and Harvard University expanded the program to 4 districts in Sindh province, building ECCE capacity among 143 young women in 100 communities, resulting in more than 2,300 children who had improved developmental outcomes. As they expanded the program, the AKU team generated strong evidence of child development outcomes and cost-effectiveness, demonstrating that the program was effective as it scaled and that it offered good value for money.

The implementation team credits GCC's funding with enabling them to create a strong evidence base, which brought the NCHD on board and led to the eventual handover of the program.

"GCC funding was critical to creating an evidence base that we used to advocate for ECCE, and this evidence is working in terms of getting attention for ECCE and motivating the government partners to incorporate it and collaborate."

The NCHD is now integrating the LEAPS program within their full suite of services, with the aim of scaling the program across Sindh. The NCHD is leading the implementation and providing technical support to ensure program expansion and sustainability, while the AKU team continues to provide technical ECCE guidance. Through this work, they have built a strong network of partnerships that include funders, academic research partners, the World Bank, and UNICEF.

"We gave the government a vision for ECCE and raised awareness for the importance of ECCE initiatives.There was no previous work or strong capacity in ECCE [in Sindh]."

Receiving Seed and Transition to Scale funding provided stable and continuous support as the project team moved their innovation from the pilot stage to the early stages of scaling. GCC's flexibility during the COVID-19 allowed them to make important pivots in response to the pandemic, including virtual training and

supervision for the CYLs. Throughout their GCC funding, the AKU and Harvard team benefited from participating in the Saving Brains learning platform, which is a community of practice among innovations working in the early childhood development sector.

"[The] workshops and platforms to come together and reflect had a big influence on the way we think. Being connected to other grantees was a very helpful opportunity to learn about their experiences."

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Enablers for Scale

The AKU and Harvard team emphasized the importance of strong partnerships as an enabler for scale, which they fostered in the following ways:

- Leveraging the varied skills across the LEAPs four-person leadership team to connect with different partners and stakeholders.
- The aim from the beginning was to create demand for ECCE within local communities and among partners. Their strategy was to demonstrate the difference that good quality ECCE makes in children's lives, and to have the CYLs carry out community engagement activities to spread the word, which proved to be very effective.
- Relationship building is an iterative process, that takes time and benefits from regular communication and input from partners at all levels.

Sometimes partnerships are flexible, sometimes they're bureaucratic – so you need to be realistic about expectations. You need to be able to work within these constraints, and appreciate that relationship building is an iterative process that takes time, and is important.

Case Study: Clinton Health Access Initiative

Transforming Child Health Services in Nigeria's Private Sector

The Challenge

Nigeria has one of the world's highest mortality rates for children under five years, with an estimated 884,000 children dying in 2020 alone [8], primarily from communicable diseases like malaria, diarrhea, and pneumonia. These illnesses can be easily prevented and treated with timely access to care.

The Innovation

The Clinton Health Access Initiative (CHAI) developed an innovative market-building approach to tackling childhood mortality in Nigeria. CHAI's model involves providing small, private sector medical vendors (known as Patent and Proprietary Medicine Vendors, or "PPMVs") with routine coaching and mentoring on the management of childhood illnesses, such as malaria and pneumonia. CHAI's model also connects these retailers to affordable, high-quality medical suppliers, and strengthens referral linkages for cases where acute care is needed.

GCC's Investment

Transition to scale funding for $1M, from 2019 – 2021

Scaling Pathway

Hybrid, public and private sector

Scaling Status

Pivoting

Scaling Journey

Throughout Nigeria, PPMVs play an important role in healthcare provision, as these local vendors are often the first point of contact with the medical system when an individual is unwell. PPMVs are well-known in their communities since they are the most accessible source of care. The quality of products and services offered by these vendors varies considerably, and CHAI's innovative model focused on strengthening the capacity of these vendors, who play an important role in the provision of healthcare.

To improve diagnosis and treatment of malaria and pneumonia, CHAI worked with the existing retailers association, the Nigerian Association of Patent and Proprietary Medicine Dealers (NAPPMED), to build the capacity of the PPMVs. The NAPPMED team conducted one-on-one visits to the PPMVs to coach them on case management and referrals, and to improve data collection on the services provided and the availability of essential commodities. To improve access to essential medicines and commodities, CHAI facilitated direct connections between 25 high-quality pharmaceutical suppliers and PPMVs, removing the "middlemen", which helped reduce prices and increased availability of medicines and supplies. CHAI worked with the State Ministries of Health (in Kano and Kaduna) to establish referral linkages between PPMVs and public

facilities, which enabled the PPMVs to identify and refer more severe cases.

GCC's funding supported CHAI to scale their market-building innovation across all 67 local government areas in Kano and Kaduna states in Nigeria. With GCC support, CHAI was able to accelerate partnerships with the Nigerian government, with the private sector, and with other major funding partners.

The program helped make significant strides in facilitating engagement between the government and PPMVs to better recognize the role PPMVs play in the health system. CHAI facilitated sharing of data between government and PPMVs, including the volume of patients seen and referred, the availability of medicines, and the quality-of-care.

CHAI also strengthened partnerships with private sector pharmaceutical companies. At the onset, CHAI mapped the major wholesalers and distributors of key essential commodities - including family planning and child health commodities in the two states while also specifically targeting wholesalers in rural areas and those with extensive rural footfall to be engaged for the program. These suppliers and wholesalers were linked with PPMVs for direct sale of commodities thereby establishing a platform for a sustainable last mile supply chain system for quality and affordable essential medicines.

When the COVID-19 pandemic hit, CHAI pivoted its program to support the government with its pandemic response. The Nigeria government leveraged CHAI's comprehensive database of PPMVs and CHAI supported the government's risk communication and community engagement activities by disseminating accurate information about COVID-19 to PPMVs. CHAI engaged and trained PPMVs on how to mitigate the spread of COVID-19 through maintaining infection prevention, and control measures, and make referrals to hospitals for severe COVID-19 cases.

GCC support began at an important moment and was leveraged by the government to improve access, and therefore was incorporated into the mainstream health system.

Work done with GCC funding created visibility of the best practices and opportunity of this innovation, standardizing practices, and potential outcomes.

> **CHAI and the GCC investment manager had regular communication to share project progress and challenges.**
>
> **These engagements were supportive in brainstorming solutions to the challenges we faced, including navigating the impact of the COVID-19 pandemic on the project.**

CHAI also partnered with the government to improve the provision of life-saving oxygen, and GCC provided guidance and support to help CHAI raise funds to support this new area of work.

By the end of the GCC funding, CHAI had enrolled 4,500 PPMVs in the program, and more than 70,000 children had been accurately diagnosed and treated for diarrhea, malaria, and pneumonia. An estimated 200 lives were saved through timely access to life-saving treatment for diarrhea, malaria, and pneumonia.

During the GCC funding, CHAI received advisory support on gender equality, and made enhancements to their PPMV training to ensure services provided by PPMVs were sensitive to gender-related healthcare needs and barriers to receiving care.

Following the gender training, CHAI saw a considerable improvement in boys and girls receiving the same quality of care. CHAI's gender equity PPMV training and resources have been shared extensively with their partners (including government partners), and these partners are now including gender equity components in their interventions. Through their SRHR programs, CHAI is continuing to support the government with the development and implementation of the national gender in health policy.

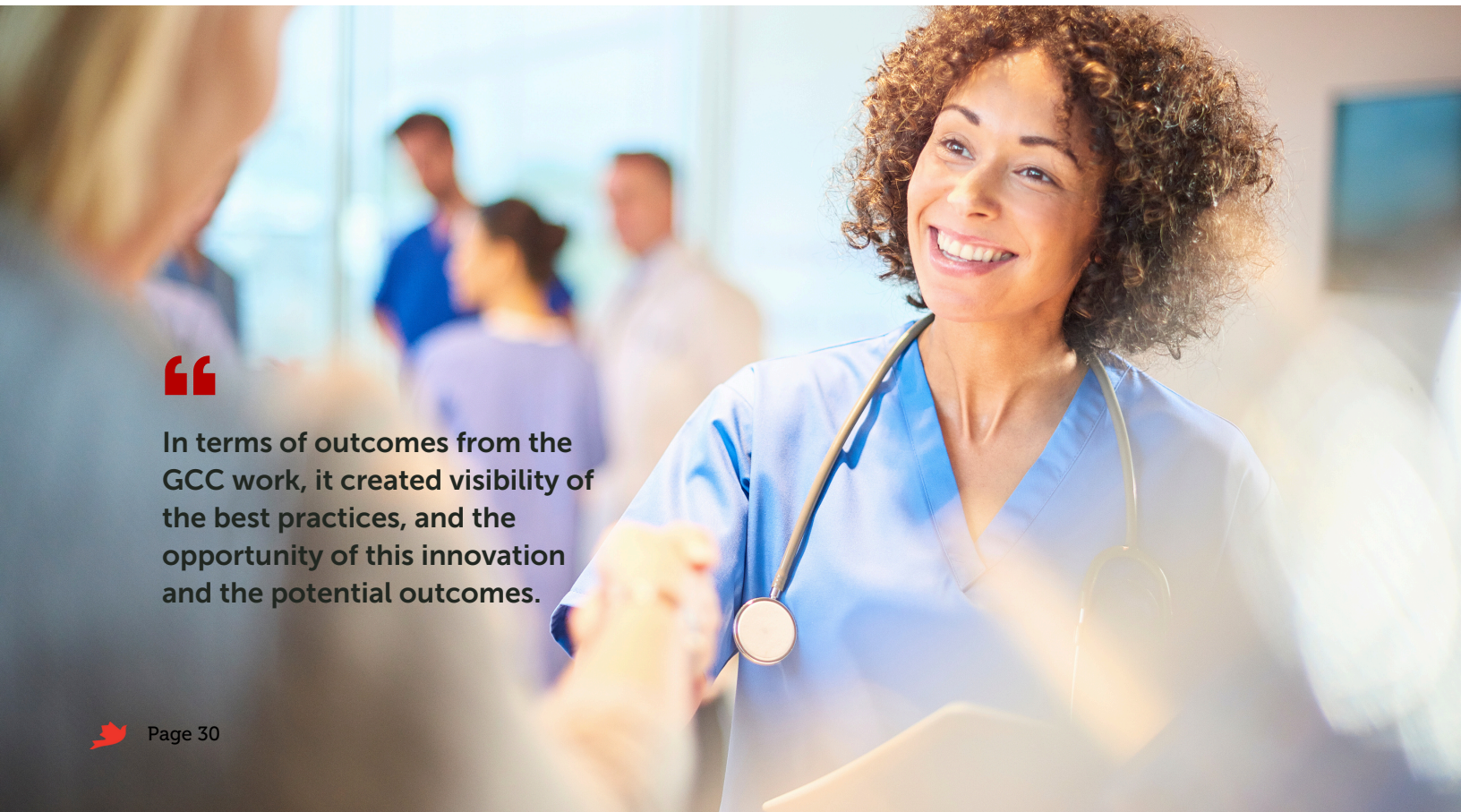
CHAI is also involved in ensuring that gender equity is incorporated into the integrated community case management guidelines and policies. In partnership with the government, CHAI is using evidence from their work with PPMVs to expand access to a wider range of health services in additional locations. CHAI's approach has been to work with the government and other partners to adopt the model. They hope to raise more funds to support further scaling in childhood illnesses.

CHAI's long-term approach to sustainability is to transfer ownership and implementation to the government and other partners. CHAI has proven that the model is successful for a wide of health issues and has disseminated the results and tools used to government stakeholders and other partners. The government is exploring the possibility of expanding the model into nine states, and the National Malaria Elimination Program is planning to launch private sector quality-of-care intervention in five states, which has been informed by lessons learned from CHAI's model.

Enablers for Scale:

In terms of key enabling factors for their innovation, the CHAI team shared the following:

- Evidence generated through the GCC funding significantly helped strengthen existing partnerships with government, and the private sector.
- Strong partnerships that were previously developed over the course of a decade, were fundamental to the success of the model. CHAI leveraged its unique position as a large and well-respected NGO to ensure that all the relevant players had a voice, including those that were typically overlooked such as the PPMVs and NAPPMED.
- CHAI's connections to other large players, such as USAID and UNICEF, have facilitated the dissemination of evidence and learning, and provided a forum for contribution to policy work.
- CHAI's work helped formalize the PPMV system within the two states, which was previously informal and fragmented. This has led to a larger and stronger network of PPMVs.



> **In terms of outcomes from the GCC work, it created visibility of the best practices, and the opportunity of this innovation and the potential outcomes.**

Case Study:
Population Services International

Creating a Sustainable Sanitation Market for Rural Bihar

The Challenge

Open defecation has been a longstanding problem in India, posing serious public health and social challenges. This widespread practice not only exposed individuals to diseases, such as diarrhea and hepatitis, but also had profound implications for the dignity and safety of women and girls, who faced increased vulnerabilities when venturing into open, unprotected spaces. In recent years, significant progress has been made in sanitation infrastructure and behaviour change across India.

The Innovation

Population Services International (PSI) developed an innovative market development approach to support eradication of open defecation in rural and underserved communities in Bihar, India. PSI's approach addressed 3 key barriers to toilet ownership:

1) the cost of toilet installation was too high for many rural, low-income households;

2) a broken supply chain made toilet installation complex and burdensome;

3) ingrained social norms perpetuated open defecation.

PSI partnered with a local micro-credit fund, which provided small sanitation loans to help households purchase toilets and provided bridge funding to small sanitation enterprises. PSI streamlined and strengthened the fragmented supply chain by identifying local sanitation entrepreneurs, and then training them to establish or revitalize sanitation enterprises and create a network of material suppliers to make the sourcing of supplies easier. To generate demand for toilets at the household level, PSI engaged local community members as Toilet Motivators, who carried out

outreach and awareness raising activities to inspire and motivate people to use toilets, rather than defecating in the open.

GCC's Investment

Transition to scale funding for $1M from 2018 – 2020

Scaling Pathway

Commercial, private sector

Scaling Status

Challenge addressed

Scaling Journey

GCC's funding was instrumental in helping PSI create and scale a market for sanitation entrepreneurs across Bihar State. From 2018 – 2020, PSI trained more than 230 sanitation enterprises and 760 Toilet Motivators, more than doubling their initial target for the funding period. The Sanitation enterprises were provided with capacity building and marketing support, and connections to small loans to enable their businesses to grow. When PSI began working with sanitation enterprises, the high cost of supplies made it difficult for them to purchase key input materials. By forming networks of sanitation enterprises that purchased supplies together in bulk, the costs came down and it increased their bargaining power. The Toilet Motivators were provided with training on water, sanitation and hygiene, and community engagement, and they organized more than 21,000 community meetings. Overall, more than 140,000 households purchased toilets during the funding period.

GCC provided advisory support to help PSI develop a gender equality strategy, which helped PSI engage women more meaningfully in their sanitation activities and increased their impact. As a result of the gender equality strategy, PSI recruited more than 250 women as Toilet Motivators, more than five times the original target of 50. The women Toilet Motivators used different approaches to organizing community events and connecting with households than the men did, which helped drive greater demand for toilets across Bihar. For example, it was easier and more acceptable for female Toilet Motivators to access other women in their homes during outreach activities.

PSI's innovation was well aligned to the national Clean India Campaign, which helped accelerate PSI's work. The Clean India Campaign contributed to remarkable progress, with over 500 million people across India receiving access to improved sanitation facilities [9] between 2014 - 2019, which led India's President to declare India to be Open Defecation Free.

"We were working with female toilet motivators, and GCC helped us focus on these and encourage female participation into the project...we realized we should look at how gender equity plays a role in the business. We didn't look at any of these factors before."

According to the World Bank, nearly 80% of people in India were using at least basic sanitation facilities as of 2022. [10] This progress has been mirrored in Bihar, and PSI's market driven approach has been successful in creating and sustaining a strong toilet supply chain and market. Having achieved its sanitation objectives, PSI has largely exited from sanitation activities and has now turned its attention to health systems strengthening in Bihar. Learnings from the work in Bihar have informed PSI's sanitation projects in Ethiopia and Cote d'Ivoire.

The COVID-19 pandemic and ensuing lockdowns affected toilet sales and installation, and many businesses were forced to halt all activities. Once the lockdowns were lifted, many of the businesses were still struggling and some contacted PSI for support. PSI responded by facilitating access to micro-loans, which provided the sanitation enterprises with financing to re-start business activities.

In 2022, PSI followed up with a sample of sanitation enterprises and found that more than 90% were still selling toilets, and more than two thirds of these entrepreneurs have diversified their revenue streams for other household infrastructure products (e.g., cement products).

Enablers for Scale:

The PSI team shared several factors that had enabled them to scale the innovation throughout Bihar:

- The political support from the Indian government through the Clean India Campaign helped accelerate PSI's work. While PSI did not have a direct partnership with the government, the Campaign drew attention to the importance of toilets and latrines, and some sanitation enterprises were able to tap into a government incentive program to support the installation of toilets.

  Due to the complexity of obtaining government sanitation incentives, many of the sanitation enterprises preferred working with PSI's micro-finance partner to obtain financing to support their business.

- GCC's flexible funding enabled the PSI team to operate according to the unique needs and contextual factors in rural Bihar, and make pivots when necessary. They found the support from the GCC team to be helpful in developing effective strategies that improved the quality of the project implementation, and the project reporting.

- GCC's gender equality advisory support guided the PSI team in considering the unique gender barriers and safety concerns for women engaged in their innovation. With support from GCC, PSI developed a gender equality strategy that helped them address some of the barriers, which led to greater engagement of women, and increased impact.

- PSI hired a local team that was based in or from Bihar. The team in Bihar was well placed to facilitate local connections in the sanitation sector and directly support the sanitation enterprises in growing and scaling their businesses.

“

This project would not have been possible without GCC funds. We initially thought the [GCC] system was rigid, but then realized that was not entirely true...it was helpful to have GCC support through the project period. We were not expecting a lot of input from GCC [about how to run the project]. [We] got support on how to be flexible and keep correcting the project and improving it, and there were no restrictions from GCC's side.

Case Study: Philips African Innovation Hub

Children's Automated Respiration Monitor (ChARM)

The Challenge

Pneumonia is the deadliest infectious disease amongst children under five, claiming the lives of more than 700,000 children each year. [11] Pneumonia often goes untreated due to the difficulty of accurately diagnosing cases in community-based settings in low-income countries. Assessing respiratory rate accurately is an essential step for pneumonia diagnosis, and typically relies on subjective observation and manual counting to measure breathing in children, which can lead to misdiagnosis, underdiagnosis, and over-prescription of antibiotic treatment. [12]

The Innovation

The ChARM device was developed by the Philips' African Innovation Hub to address the challenge of diagnosing pneumonia. The ChARM device is a handheld, battery-powered breathing rate monitor designed to improve community-level diagnosis of pneumonia in children. The device automatically detects the breathing rate of a child and is dust-proof, water resistant, and can be used in extreme temperatures. An initial prototype was developed in 2012 by Philips' African Innovation Hub in response to a call to action put out by UNICEF after consultation with healthcare providers in East Africa and India.

GCC's Investment

Transition to scale funding for $1M, from 2019 – 2021

Scaling Pathway

Private sector

Scaling Status

Not scaling

Scaling Journey

GCC supported the Philips' African Innovation Hub with a $600K loan in 2014 for commercialization of the ChARM device. With TTS funding, the ChARM team tested the market, and found that there was a potential market and that it was sufficiently large enough to unlock further funding from Philips Corporation to help it scale, and to pay back GCC's loan. The device obtained the necessary regulatory approval and CE mark for global distribution, and it was released to market in 60 countries in 2016. ChARM found early success in a few hybrid markets (e.g., government and private sector uptake in East Africa), but ultimately, the ChARM team was unable to sufficiently activate the market, and they were unable to sell an adequate volume of product to make it commercially viable.

The ChARM device was procured for a UNICEF feasibility trial for the Acute Respiratory Infection Diagnostic Aid (ARIDA) project to assess the health impact of using automated devices to improve pneumonia diagnosis in community settings. It was hoped that the results of the ARIDA study would provide the needed evidence to persuade the WHO to update its guidelines for pneumonia diagnosis and recommend that community health workers use automated devices for monitoring respiration rates (rather than the manual and observational method). While the results of the study were favourable, and the device was found to be effective, they were unable to test its effectiveness in a controlled environment in an LMIC setting, which limited the overall usability of results. The evidence was not strong enough to persuade the WHO to change its guidelines. Without a change in the WHO guidelines, there was no 'incentive' for Ministries of Health to invest in respiration monitoring technologies like CHARM, and this was a considerable barrier that prevented the ChARM device from succeeding commercially.

Given the challenges with activating the market, combined with the fact that the respiration monitor did not fit neatly within any of Philips Corporation's product clusters, the Philips Corporation eventually pulled the funding for the ChARM device. Funding for the African Innovation Hub came to an end not long afterwards, which meant the team working on the respiration monitor lost core funding to move the innovation forward. At this point, they had partnered with Novartis to tackle childhood pneumonia, where the Philips African Innovation Hub had developed the diagnostic and Novartis had developed the treatment, but when Philips cut their funding, they were not able to move forward with this partnership. While Novartis offered to provide more funding for the project, they could not cover the entire shortfall from Philips.

To encourage widespread use of the device for accurate, efficient pneumonia diagnosis in low-income settings, the technology was made open source, and it has since been spun out into a venture/incubator that is looking at bringing it to scale.

One positive outcome is that they made sufficient revenue to be able to pay back 50% of GCC's loan.

"We were able to pay GCC back, but we weren't able to reach our overall objectives...the project is now defunct."

Despite these challenges, and the fact that the project is currently "defunct", the team is still trying to move the respiration monitoring device forward and are in conversations with potential investors. The ChARM device is a cost-effective technology that was developed within and for an emerging market context, and the ChARM team feels that it is worth pursuing further as the respiration monitor as fills a key need in the LMIC healthcare market.

Lessons Learned:

- For commercial innovations targeting low-income markets, there is a need for support in developing private sector and community-level (e.g., NGO) relationships to support market development, sales and uptake. In developing these relationships, the focus should be on long term, end-to-end partnerships and collaboration.

- Focusing on a few key regions with strong government interest in the device may have been a more viable strategy than releasing the product into 60 markets all at once. If this approach was successful in generating widespread uptake of the device in a few locations, it could also be used to generate evidence to support uptake in additional geographies. For example, the Ethiopian government was interested in purchasing the device and integrating it into its pneumonia program, but needed co-funding to support implementation research before it could move forward with the device.

- Greater collaboration between GCC and Philips Corporation on the go to market strategy could have potentially supported market creation and policy change. While GCC was able to draw attention to the device at global policy forums, the ChARM team felt that GCC could have potentially provided deeper support in bolstering fundraising efforts, creating market in-roads with other innovations within GCC's portfolio, or with country government relationships.

- The cost of regulatory approvals in EU market was prohibitive, and curbed production/sales for this market, preventing the ChARM team from employing a dual market strategy to support scale in LMICs.

- Collecting evidence and proof points at various stages in the commercialization and scaling journey is key and should be built into the planning and financing. For example, the ChARM team did not have the resources to conduct cost effectiveness studies or health outcome studies, and while there was considerable anecdotal evidence coming from the users indicating positive health outcomes, it was not sufficient to stimulate the market and bring the innovation to scale.

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MaRS Centre, West Tower
661 University Avenue, Suite 1720
Toronto, Ontario, Canada
M5G 1M1

www.grandchallenges.ca

Bold Ideas With Big Impact®

Report design by:
Nadia Somani
Chloe Panganiban

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