



# HealthRise



## HealthRise Final Report

Expanding Access to Chronic Disease Care through Community Approaches in Four Countries



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We also extend thanks and appreciation for the creative, diligent work of the members of each country's Country Advisory Committee and the numerous HealthRise in-country implementation and management partners: in Brazil, the Universidade Federal dos Vales do Jequitinhonha e Mucuri, the Telehealth Network of Minas Gerais of the Universidade Federal de Minas Gerais, the Universidade Federal da Bahia, Universidade Estadual do Sudoeste da Bahia, Servico Social da Industria, and Instituto de Ensino e Pesquisa do Hospital Sírío-Libanês; in India, the Catholic Health Association of India and the MAMTA Health Institute for Mother and Child; in South Africa, Expectra Health Solutions, Project HOPE, and the Human Sciences Research Council; and in the United States, HealthFinders Collaborative Inc., Regions Hospital and Pillsbury United Communities.

We also acknowledge the excellent work of the Institute for Health Metrics and Evaluation at the University of Washington, which performed the independent evaluation that informed and confirmed many of the program learnings and recommendations discussed in this report.

We are indebted to the dedicated frontline workers including doctors, nurses, community health workers, and other healthcare workers who mobilized communities, screened, treated and empowered tens of thousands of patients, and whose continued contributions will be essential to ongoing initiatives to address chronic disease outcomes.

Finally, we extend sincere thanks to the patients themselves, whose courageous efforts to manage their chronic conditions and live their healthiest lives are at the heart of HealthRise's mission and achievements.

# ACRONYMS

ASHA	Accredited social health activist
ANM	Auxiliary nurse midwife
BHU	Basic health unit
CAC	Country Advisory Committee
CHAI	Catholic Health Association of India
CHW	Community health worker
CP	Community paramedic
EMR	Electronic medical records
HFC	HealthFinders Collaborative
HRTO	HealthRise Teofilo Otoni
HRVC	HealthRise Vitoria da Conquista
HSRC	Human Sciences Research Council
IEP	Instituto Sírio-Libanês de Ensino e Pesquisa
NCDs	Noncommunicable diseases
NGO	Non-Governmental Organization/Non-for-Profit
PUC	Pillsbury United Communities
SBP	Systolic Blood Pressure
SESI	Serviço Social da Indústria





*“It was because of this project that I found out about my condition”*

*– HealthRise patient, Brazil*

Photo Credit: Medtronic Foundation

## EXECUTIVE SUMMARY

### GOALS AND OBJECTIVES

In 2014, Medtronic Foundation and its partners launched HealthRise, a five-year global effort to expand access to care for cardiovascular disease and diabetes among underserved populations in Brazil, India, South Africa, and the United States. HealthRise aimed to contribute to the World Health Organization’s goal of reducing premature mortality associated with chronic noncommunicable diseases (NCDs) by 25 percent by 2025. From 2015-2018, partners implemented and evaluated innovative, scalable, and sustainable community-based demonstration projects that addressed priority barriers. Nine demonstration projects across four countries tested various models to meet two objectives: 1) increased detection of hypertension and diabetes, and 2) improved disease management and control through integrated, community-based care delivery. All projects focused on empowering patients, strengthening the frontline health workforce, and advancing policy and advocacy to improve chronic care outcomes among underserved populations.

### RESULTS

Across the nine sites, HealthRise screened nearly 65,000 previously undiagnosed people—more women than men—for hypertension and/or diabetes; identified 9,004 cases of previously undetected high blood pressure and/or high blood sugar; and helped 3,139 patients achieve blood pressure control and 1,034 patients achieve blood sugar control. Comprising 60 percent of community health workers, 3,637 were trained on diabetes and hypertension related topics and four sites held 710 support groups or NCD meetings.

The impact of HealthRise goes beyond the change in health outcomes. The final evaluation of the program noted that patients were empowered through improved knowledge on risk factors and detection. HealthRise also forged stronger links between underserved communities and the health system through frontline health workers and engaged local governments and partners to reach previously unserved patients.

## THE FUTURE

HealthRise and its partners have worked to sustain the program through local communities, health systems and public-private partnerships. It also worked to document and disseminate key findings and results to inform health policy makers at the local, regional, and national levels; NGOs and community-based organizations designing and implementing global health and primary care programs; organizations engaged in NCD, health systems, and universal health coverage research; and hospitals and clinics working to improve outcomes for underserved populations.

# INTRODUCTION: THE GLOBAL PROGRAM

## GOALS AND OBJECTIVES

HealthRise's goal was to contribute to the WHO's goal of a 25 percent reduction in premature mortality by 2025 through innovative, scalable, and sustainable demonstration projects across Brazil, India, South Africa, and the United States. It worked to achieve this goal through two objectives: 1) Increasing early detection of hypertension and diabetes; and 2) improving management and control of these chronic conditions. Partners empowered patients, strengthened frontline health worker capacity, and advanced policy and advocacy.

## PARTNERSHIP MODEL





HealthRise was built with the premise that sustainable change comes from local solutions, but that lessons, approaches and best practices could be shared and applied across communities globally. The program started with rigorous needs assessments by site, which assessed sub-state prevalence and identified key barriers to improved outcomes. Findings were shared with local stakeholders, and who worked with Medtronic Foundation and its global partners to prioritize barriers. HealthRise then selected not-for-profit, non-governmental organizations (NGOs) with the most innovative, scalable and sustainable proposed solutions for implementation. NGOs were supported and guided by "Country Advisory Committees" (CACs) which included government representatives, key opinion leaders, private sector, and importantly, patient and frontline health worker participants. The program routinely monitored the cascade of care from screening to diagnosis, diagnosis to care and treatment, and treatment to control, as well as indications of health system improvement including health workers trained and rates of referral. The endline impact evaluation assessed improved diabetes and hypertension outcomes, relative to baseline and control groups, where those data were available.

## MAJOR HEALTHRISE INTERVENTION ELEMENTS

Although local programs were individually tailored to locally specific conditions and included many variations and unique innovations, for the most part all programs featured some version of the following main elements: community screening, health worker training, household visits, health facility-based/point-of-care diagnosis and treatment, and peer support groups.

Specific interventions by country, informed by each country’s needs assessment, follow in the exhibit below:

### Exhibit 1: Major HealthRise Program Elements by Country

 <p><b>BRAZIL</b></p>	<ul style="list-style-type: none"> <li>• Screening at health fairs, homes, and industry association clinics</li> <li>• Training of health care professionals and community health workers</li> <li>• Point-of-care HbA1c testing</li> <li>• Web-based clinical decision support system</li> </ul>	<ul style="list-style-type: none"> <li>• Local patient association and patient support groups</li> <li>• Public gyms and physical education sessions</li> <li>• Strategic planning and restructuring of workflows at primary healthcare units</li> </ul>
 <p><b>INDIA</b></p>	<ul style="list-style-type: none"> <li>• Screening camps in villages and local health facilities</li> <li>• Training of public sector health care professionals and community health workers</li> <li>• Home visits with patients</li> <li>• Call center and text messages for patients</li> </ul>	<ul style="list-style-type: none"> <li>• e-Consultations for patients at remote clinics</li> <li>• Electronic health card and MIS</li> <li>• Patient support groups facilitated by frontline health workers</li> <li>• Multisectoral District advisory committee consultations</li> </ul>
 <p><b>SOUTH AFRICA</b></p>	<ul style="list-style-type: none"> <li>• Screening at community and health facility events, homes, and workplaces</li> <li>• Phone calls and home visits to patients</li> <li>• Clinical nurse mentorship</li> <li>• Community health workers equipped with digital blood pressure machines and glucometers</li> </ul>	<ul style="list-style-type: none"> <li>• Patient support groups for 5-step, village saving and loans, and community gardening</li> <li>• Alignment with government strategic priorities (national health insurance, integrated chronic disease model, primary care reengineering)</li> </ul>
 <p><b>UNITED STATES</b></p>	<ul style="list-style-type: none"> <li>• Training of community health workers</li> <li>• Referral by primary care providers and community paramedics to HealthRise program</li> <li>• Individual care plans developed by patients and community care team</li> </ul>	<ul style="list-style-type: none"> <li>• Care services in the home by community paramedics and community health workers</li> <li>• New grocery store in food desert</li> </ul>

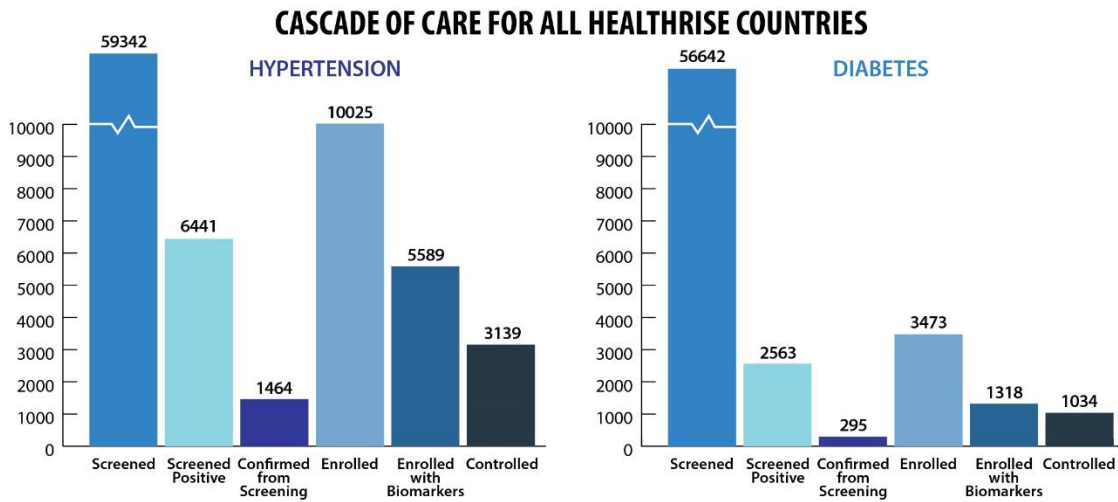


## OVERALL RESULTS

Across the nine sites, HealthRise screened nearly 65,000 previously undiagnosed people— 60 percent of them women— for hypertension and/or diabetes; identified 9,004 cases of previously undetected high blood pressure and/or high blood sugar; and helped 3,139 patients achieve blood pressure control and 1,034 patients achieve blood sugar control. The exhibit 2 below shows the cascade of care aggregated across all HealthRise countries according to program monitoring data.

The impact of HealthRise goes beyond the change in health outcomes. The final evaluation of the program noted that patients were empowered through improved knowledge on risk factors and detection. HealthRise also forged stronger links between underserved communities and the health system through frontline health workers and engaged local governments and partners to reach previously unserved patients.

### Exhibit 2



HealthRise also offers significant lessons on program monitoring and performance. For example, overall proportions of controlled cases out of those enrolled averages at approximately 31 percent for hypertension and 30 percent for diabetes; however, they vary in performance among individual countries. The HealthRise program in Brazil achieved the most notable results in disease control: patients enrolled at both sites had statistically significant declines in blood pressure and blood glucose. Two of the U.S. programs saw significant increases in patients' control of diabetes over the course of implementation. While baseline and endline comparisons were not possible, due to constraints in data collection and availability in South Africa and India<sup>1</sup>, the program evaluation noted positive impacts from HealthRise in the selected communities and health systems across all four countries.

<sup>1</sup> The endline evaluations for India and South Africa relied on cross-sectional data and were unable to compare values from baseline to endline.

## KEY TAKEAWAYS AND RECOMMENDATIONS

By design, all HealthRise demonstration projects took place in underserved communities and employed context-specific approaches to respond to social, geographic, and health system conditions. The program evaluation identified key cross-country factors that tended to facilitate or hinder project success, summarized here and detailed in each country chapter. The program also developed specific recommendations informed by findings across the four countries.

- **Invest in frontline health workers.** Preliminary evidence suggests health workers based in the community regularly initiated contact with patients, especially where they live, increasing patient retention in the care system. CHWs navigated social determinants of health, and supported patients in self-care, especially through home visits.

**Recommendation 1:** Invest in health worker capacity, applying strong implementation research to assess effectiveness of CHWs and CPs in increasing patient retention, addressing non-clinical barriers to care and social determinants of health, and overall clinical improvement.

**Recommendation 2:** Ensure health workers receive supportive supervision, and are integrated into primary care teams, valued for their linkage to patients and communities. The clinical nurse supervision model in South Africa is a compelling model. Optimize coordination with clinical care teams through information systems.
- **Patient empowerment is critical for chronic conditions but measuring it is a challenge.** Country needs assessments found HealthRise target populations had low levels of knowledge of NCD risk factors, disease states and the importance of early detection, which could suppress patient participation in screening and care. The evaluation noted health education activities effectively improved people's knowledge and management of hypertension and diabetes. However, HealthRise was not able to find or implement an effective, valid measure of patient empowerment to assess improved activation for those patients enrolled in care, which remains a key evaluation gap in the global health field.

**Recommendation 1:** Improving patient knowledge of hypertension and diabetes—including risk factors, potential complications, treatment adherence, preventive measures, and the importance of early detection—should be a part of all community-level intervention programs.

**Recommendation 2:** Develop methods of measuring patient empowerment, beyond tools like the Diabetes Empowerment Scale, and the Patient Activation Measure, for cross-cultural, underserved contexts.
- **Target screening; community-based screening saw low yield.** Except for the U.S. program, all country programs implemented community-based screening interventions as part of their model to identify undiagnosed patients. HealthRise screened tens of thousands of individuals for hypertension and diabetes, but this population-based intervention yielded relatively low results and required intensive follow up to improve

confirmation rates among those who screened positive for either hypertension or diabetes.

**Recommendation:** Future programs should consider more targeted screening approaches that could identify a higher proportion of undiagnosed patients and conduct implementation research to understand the extent of these approaches' effectiveness.

- **Focus on Outcomes and Strengthening Systems; monitor and adapt in real time.** Many resource constrained health systems face persistent and structural challenges. Interoperable, user-friendly, integrated real-time data systems was a significant gap across HealthRise sites. HealthRise local and global partners were continually challenged with accessing and reporting real-time monitoring of health outcomes and their proxies, as well as health systems indicators, especially across systems, partners and countries, which limited the programs' ability to continuously improve interventions.

**Recommendation 1:** Future community-level intervention programs should take health systems capacity into account during the design phase and continually reassess and adapt throughout implementation. The effectiveness of strategies to mitigate these weaknesses, such as dedicated chronic care hours at clinics in Brazil, merits further investigation.

**Recommendation 2:** Governments, donors, and private-sector health systems should consider investments to ensure that health information systems used by all actors in an NCD program are integrated and interoperable, and to support community and clinic providers in using the data as part of their routine visits with patients.

**Recommendation 3:** Invest in digital monitoring systems within local health systems and NGOs, using cost-effective, secure and sustainable technology. Build a culture of data for decision-making across partners and stakeholders from the beginning. Projects should also conduct an independent analysis of internet network infrastructure and address the need for internet access, bandwidth, and server space before developing digital solutions and procuring electronic devices.

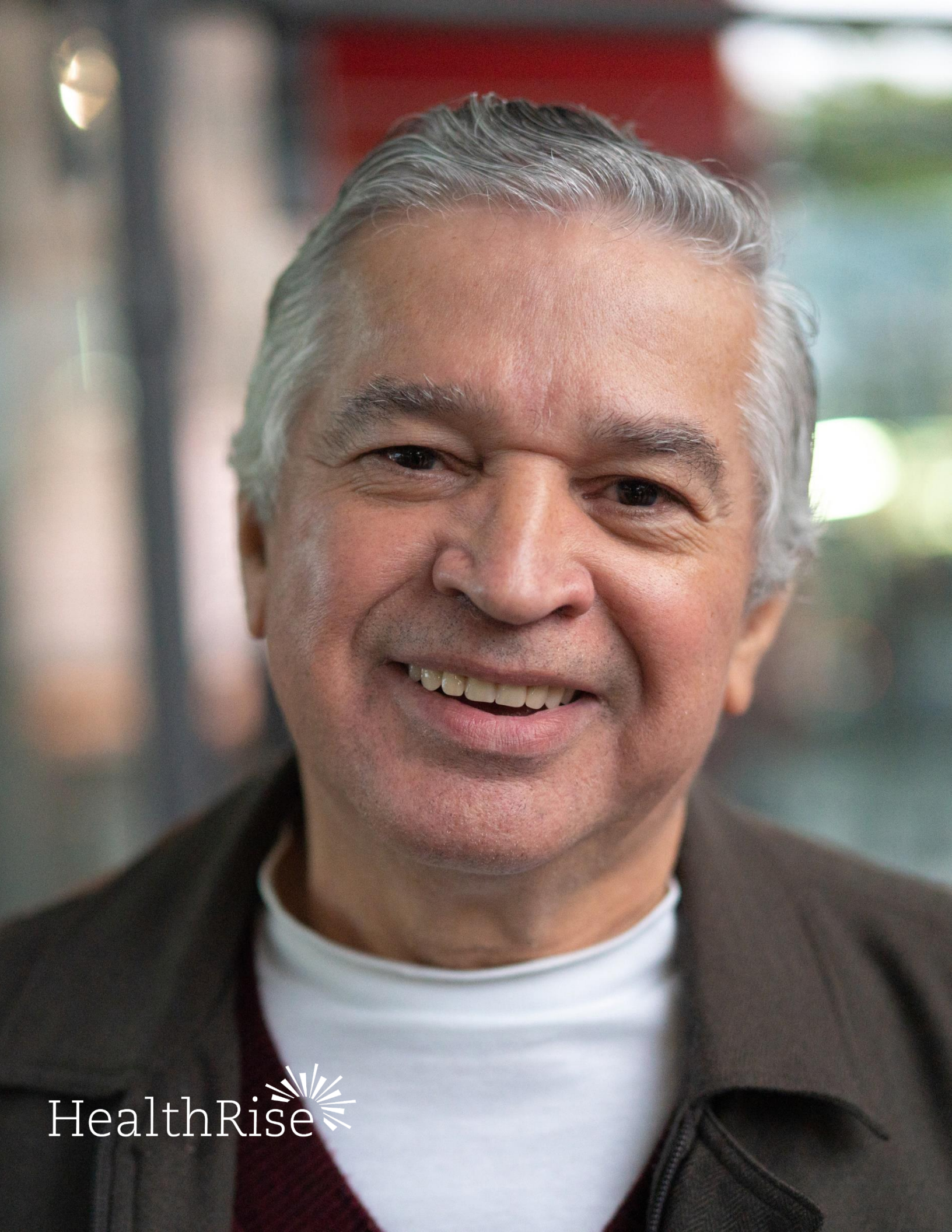
- **Continuously engage with national, state and local government, in support of their plans and priorities.** Local partner efforts to communicate and collaborate with national and local government authorities during the early planning of HealthRise projects, and continuously throughout the implementation and evaluation phases, were effective in gaining government support and were a critical prerequisite to successful HealthRise activities. Some HealthRise activities also continue beyond the life of the program because of this design, such as chronic care programs in Vitoria da Conquista, Brazil.

**Recommendation:** Future community-level intervention programs should plan to develop relationships at each level of government continuously to ensure success and sustainability. Many of the program elements begun under HealthRise will continue because they were built into the existing public health systems in close coordination with federal and municipal governments.

The following chapters describe the details of the HealthRise global program, and its experience in diverse local communities to improve chronic care for underserved

populations. For each country, the report summarizes the main interventions that were implemented; describes particularly promising innovations; details the results of HealthRise's screening, diagnosis, management, and disease control objectives; and offers country-specific takeaways and technical insights to inform future work. The final chapter of the report offers high-level conclusions and recommendations from the HealthRise initiative as a whole.





HealthRise 





*“I think the EMR [electronic medical record] resulted in a better way of communicating about the patient... any professional can now access the information stored there.”*

*– Frontline health provider, Brazil*

Photo Credit: Medtronic Foundation

## BRAZIL

### BACKGROUND

Brazil has seen a steady decline in premature deaths due to NCDs since 2000, benefiting both men and women. Likely contributing to this decline are the country’s national NCD Action Plan 2011-2022 and forward-thinking measures regarding tobacco, alcohol, diet, and physical activity.<sup>2</sup> Nevertheless, Brazil will need to make continued progress to meet its national target of a 2 percent yearly decline in NCD mortality through 2022.

According to the latest World Health Organization figures, an estimated 74 percent of all deaths in Brazil are due to NCDs, including cardiovascular diseases (28 percent of deaths, or 369,600 people) and diabetes (5 percent of deaths, or 66,000 people).<sup>3</sup> The top three risk factors for adults ages 18 and older, in order of prevalence, are physical inactivity, raised blood pressure, and obesity.<sup>4</sup> Although these top three risk factors hold true for both women and men, higher proportions of women than men suffer from physical inactivity and obesity, while men are more likely than women to have raised blood pressure.<sup>5</sup>

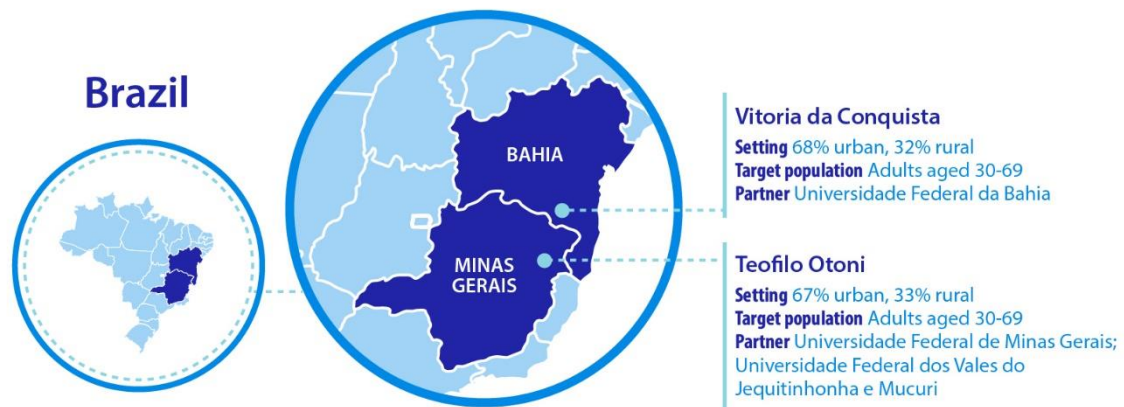
<sup>2</sup> Noncommunicable Diseases Progress Monitor, 2017. Geneva: World Health Organization; 2017. License: CC BY-NC-SA 3.0 IGO.

<sup>3</sup> Noncommunicable diseases country profiles 2018. Geneva: World Health Organization; 2018. License: CC BY-NC-SA 3.0 IGO.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

### Exhibit 9: Brazil intervention areas and partners



## NEEDS ASSESSMENT AND RECOMMENDATIONS

The Brazil needs assessment, conducted by the Institute for Health Metrics and Evaluation (IHME), drew from multiple sources including a literature review and a 2017 IHME study of two underserved cities that were socioeconomically similar to the HealthRise intervention communities.<sup>6</sup> Key findings included the following:

- **Prevalence**—A cross-sectional community-based study in HealthRise intervention areas showed prevalence of about 9.5 percent for diabetes and prevalence of more than 55 percent for hypertension. The study found no significant difference by sex. In general, older individuals, those with lower education and socioeconomic status, those reporting low or no physical activity, and those with obesity had higher prevalence rates of diabetes and hypertension.
- **Diagnosis**—Significant proportions of people living with hypertension and diabetes were undiagnosed and unaware of their disease: up to 52 percent of men with hypertension and up to 25 percent of men with diabetes.
- **Treatment**—A strong majority (78 to 90 percent) of diagnosed hypertension patients were receiving treatment. Over one-third of females diagnosed with diabetes were not on treatment.
- **Disease control**—A minority (11 to 25 percent) of diagnosed hypertension patients on treatment were meeting treatment targets. Among diagnosed diabetes patients on treatment, a minority (14 to 40 percent) had their blood glucose under control.
- **Risk factors**—NCD risk factors were high in the two HealthRise intervention communities, with over 40 percent of people overweight or obese and physically inactive.

<sup>6</sup> More information and resources about the HealthRise evaluation are available from the Institute of Health Metrics and Evaluation: <http://www.healthdata.org/healthrise-evaluation> (last accessed June 13, 2019).

- **NCD awareness and patient empowerment**—The needs assessment found low knowledge of disease symptoms and healthy lifestyles, a hesitation to seek preventive care, and low awareness of existing health facility-based educational activities and support groups.
- **Barriers to patient access**—Patients cited several issues that inhibited their access to diagnosis and routine disease monitoring, including inconvenient hours, long wait times, and lack of medications at health facilities.
- **Health system barriers**—A lack of infrastructure, equipment, and medications necessary for diagnosing and treating NCDs was found at primary healthcare facilities.

**Recommendations.** Recommendations arising from the needs assessment included the following:

1. **Empower patients** by raising awareness of NCD risk factors and symptoms, treatment resources, and the importance of healthy lifestyles and medication adherence. Suggested program elements included educational programs, support groups, increased counseling by community health agents and facility-based providers, and increased access to monitoring equipment.
2. **Improve health facility capacity** to diagnose and treat NCDs and ensure patient satisfaction, including by increasing the number of staff able to treat and counsel NCD patients.
3. **Explore home visits** to reach individuals who may avoid seeking healthcare or are unable to get to health facilities.

## PROGRAM DESIGN

The HealthRise Brazil project implemented community-based interventions targeting adults aged 30-69 in the Teofilo Otoni region and Vitoria da Conquista. The Instituto SÍrio-Libanês de Ensino e Pesquisa managed the overall country program, while local partners with extensive knowledge of the Brazilian health system and relationships with the public and private sector implemented field activities. The local partners Universidade Federal de Minas Gerais and Universidade Federal dos Vales do Jequitinhonha e Mucuri led the collaborative group HealthRise Teofilo Otoni (HRTO), and Universidade Federal da Bahia (UFBA) led the collaborative group HealthRise Vitoria da Conquista (HRVC). These consortia brought together public, private, and academic partners, and used existing platforms to bridge sectors to deliver care that was more patient-centered.

In addition to reflecting findings and recommendations from the needs assessment, the Brazil programs responded to barriers noted by the implementing partners. In Teofilo Otoni, for example, despite primary healthcare coverage for almost 100 percent of the population, partners observed poor access to basic lab tests, and patients with difficulties in managing their health conditions. The project also noted insufficient use of evidence-based protocols, and poor communication among care team members. In Vitoria da Conquista, partners saw that there was no chronic-disease management structure, and that there were too few physicians and no electronic medical records (EMR) system.

The Brazil community programs sought to strengthen the cascade of care with the following activities:

- **Screening.** Both local partners organized health fairs for screening. The health fairs involved collaboration with basic health units (BHUs) in the public sector to identify uncontrolled hypertension and diabetes patients, and to screen for new cases. In addition, HRT0 used CHWs to screen patients at homes, while HRVC partnered with the nonprofit organization Serviço Social da Indústria (SESI) to screen industrial workers at SESI facilities and reach low-wage workers (particularly men) to support them and empower them to control their disease.
- **Diagnosis.** The HealthRise Brazil program referred patients with uncontrolled conditions, or those who screened positive, to primary care centers. The exception to this was the industrial workers screened through SESI, who were followed at SESI clinics.
- **Treatment and follow-up.** HealthRise Brazil followed diagnosed patients for 12 months, including consultations at least every three months by nurses and physicians at the BHU. These consultations were more frequent in cases of uncontrolled blood pressure or glucose levels. CHWs also made home visits to patients to encourage them to stay in care and adopt healthier lifestyles.

The Brazil programs also incorporated the following innovative activities, designed in part to address specific findings and recommendations from the needs assessment:

- **Patient empowerment, peer groups and advocacy.** The HealthRise Brazil team encouraged the creation, expansion, and reorganization of support groups to help improve self-care and health literacy, with an emphasis on healthy nutrition and habits. In Teofilo Otoni, HealthRise helped establish a formal patient association for people with hypertension and diabetes, which promoted self-care activities such as healthy cooking. Health workers also referred patients to support groups, led by the Brazilian health system, that HealthRise helped expand and strengthen through training sessions focused on developing patient autonomy and storytelling. Finally, with technical assistance from HealthRise, patients engaged in HealthRise Vitoria da Conquista founded a new, local diabetes association. Both new patient associations also pursued advocacy initiatives to improve public policy and local health systems for better quality of care.
- **Improved care coordination.** HRVC worked with the national pharmaceutical care management system and pharmaceutical care units to monitor patient receipt of medication in selected BHUs. HRVC developed a mobile text-messaging system to connect insulin-dependent patients with a pharmaceutical-care unit and to foster regular consultations with health professionals and healthy lifestyle habits. Pharmacists have expanded this system's use to include hypertension patients who get their medication at pharmaceutical care units.

To improve access to doctors and nurses for diabetes and hypertension patients, HRVC collaborated with the municipal health department to review patient flow and scheduling and organize dedicated clinic time. Through a partnership signed with Bahia State

University, the university's specialized clinic increased the number of specialist appointments in cardiology, endocrinology, and angiology for patients requiring secondary care consultations and exams.

- **Improved health facility capacity.** HealthRise collaborated with municipalities to pioneer new tools, training, and diagnostics so frontline health workers could deliver more patient-centered care. To reduce delays and become more proactive, both regions tested the use of HbA1c point of care technology<sup>7</sup> during consultations. HRVC supported 16 facilities in moving from a paper-based system to the country's public web-based medical record system (eSUS).

For the first time, the region also introduced clinical guidelines for diabetes and hypertension care at the primary care level. HERTO developed and rolled out a new clinical decision support system to make recommendations for health providers and create individual plans for patients. The program also created online courses to update the knowledge base of primary healthcare teams who provide routine care to patients with diabetes and hypertension. More than 80 percent of all frontline health workers completed the coursework.

The Brazil Country Advisory Committee—consisting of government, private sector, civil society, and health worker representatives—played a central role in many of these capacity strengthening efforts. The committee provided suggestions, monitored progress and results, and served as a mechanism for HealthRise to communicate and discuss its results with key stakeholders; it was through such stakeholder contact, in fact, that the idea of using HbA1c point-of-care testing during consultations first surfaced and that the Federal Ministry of Health committed to HealthRise sustainability

## RESULTS

Notably, the quantitative evaluation found statistically significant reductions in blood pressure and glucose readings in HealthRise patients, especially in Vitoria da Conquista which had more patients with uncontrolled disease at baseline. Patients at endline in Vitoria da Conquista saw an average systolic blood pressure (SBP) decrease of 4.2 mmHg and an average A1c decrease of 0.9; patients in Teofilo Otoni recorded average decreases of 1.9 mmHg and 0.7 A1c decrease. As a consequence, patients across both sites made significant progress in meeting treatment targets (A1c < 8% and BP < 140/90 mmHg). In Vitoria da Conquista, approximately 46 percent of patients at endline met hypertension targets and about 62 percent met diabetes targets, compared to approximately 35 percent and 37 percent at baseline, respectively. Approximately 52 percent of patients with hypertension and about 61 percent with diabetes met treatment targets in Teofilo Otoni at endline, compared to approximately 48 percent for hypertension and about 52 percent for diabetes at baseline. The endline evaluation in Brazil did not include a comparison group.

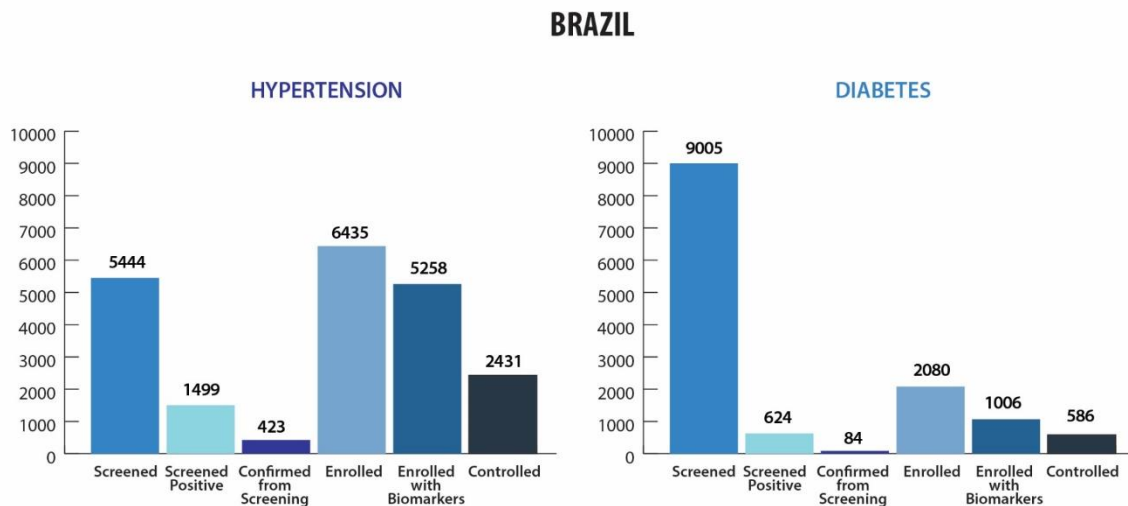
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<sup>7</sup> HbA1c testing measures glycated hemoglobin A1C, which indicates the average blood glucose level for the past two to three months.



Exhibit 10 shows program monitoring data on the number of screenings for hypertension and diabetes, the number of positive screenings, the number of those positively screened cases that received a confirmed diagnosis of disease, the number of cases enrolled in HealthRise programs, the number of enrolled cases for which biomarker data was available, and the number of controlled cases out of patients with biomarker data. The program saw a relatively low yield of newly diagnosed patients out of the number of those screened positive, and a higher rate of retention of patients with biomarkers with hypertension compared to those with diabetes.

**Exhibit 10: Cascade of care results, Brazil**



Additional quantitative results from the Brazil HealthRise projects show that:

- 30 health fairs were held
- 10 online courses and other education materials were produced
- 979 health workers received training, including 583 CHWs
- 831 patients attended support groups
- 229 patients attended public gyms (HRVC) or regular exercise sessions (HRT0)

Additional findings of note from the HealthRise endline evaluation included the following:

**Patient empowerment.** The evaluation provided qualitative evidence that suggests that patient education activities made a difference. The evaluation found that patients from HealthRise facilities demonstrated more knowledge than patients at comparison facilities about NCD symptoms, risk factors, disease complications, and basic disease management, including diet modification and exercise. Health providers also reported that group activities for patients intensified during HealthRise.

**Challenge:** While patients gained valuable knowledge about self-management of disease, qualitative evidence suggests that they were not always successful in

adopting healthier lifestyles and adhering to treatment. During the evaluation, patients said that adjusting their diet and exercising proved challenging. Further, they noted that the number of prescribed drugs for hypertension was burdensome, and that medications and tests were not always available in the public health system. Moreover, longitudinal assessment of patient empowerment was not possible with existing tools in Brazil. The program translated the Diabetes Empowerment Scale in Portuguese, but with unreliable results.

**Health facility capacity.** Qualitative findings from the endline evaluation point to several improvements in health facility capacity. The Brazil program resulted in reorganized patient flows and health unit routines, which frontline health workers saw as leading to better and more structured delivery of care. Patients and health providers both noted that some specialized tests were more available after the implementation of HealthRise. Staff also noted the value added by the use of tablets and the implementation of EMR (in Vitoria da Conquista) and the Decision Support System (in Teofilo Otoni), according to the IHME evaluation.

**Challenge:** Facility staff and policy makers interviewed during the evaluation pointed to medication stock outs, staff shortages, and barriers when referring patients to other specialists (such as nutritionists and physiotherapists) as particular challenges. Despite these observations, evidence suggests that the HealthRise sites did better in these regards than the comparison sites, where the evaluation found “more escalated” complaints about medication stock outs and the process of referring patients to specialists.

## SUSTAINABILITY, SCALE-UP, AND REPLICABILITY

Many of the program elements begun under HealthRise will continue because they were built into the existing public health system in close coordination with municipal governments. The Brazilian Ministry of Health, through Albert Einstein Hospital, will fund the next phase of work. By incorporating the two former HealthRise cohorts into their framework of big data, the new phase will engage CHWs to collect data from patients to generate predictive models and identify patients’ different risk levels. The results will support a patient-centered approach for NCD care at the primary level. The HRTO local partners developed a partnership with the UK Medical Research Council to conduct a study on scaling up diabetes and hypertension interventions in Teofilo Otoni. Funding was recently approved for this partnership to scale up HealthRise interventions across 34 Basic Health Units. Clinics will continue to provide dedicated consultation hours for diabetes and hypertension patients in Vitoria da Conquista. The health system will also maintain implementation of continuing education in NCDs for health workers in this region.

## KEY TAKEAWAYS AND TECHNICAL INSIGHTS

*Integration among health professionals promoted cooperation and productivity.* Collaboration with medical schools brought faculty and students closer to the communities and frontline health workers in the primary care settings. Online courses designed for care teams

encompassing providers at the community and facility level, rather than individual types of health workers, also encouraged collaboration. This integrated approach promoted cooperation among different types of providers and optimized productivity across the health delivery and health education sectors. Further, the fact that the HRT0 and HRVC projects were implemented by local universities meant that students, including medical students, had a unique opportunity to deepen their knowledge and gain high-standard, hands-on experience working with patients and providers in the local health facilities—an investment that will bear real dividends for future NCD patient care in Brazil.

*Local health system gaps impeded care for NCD patients.* The lack of a chronic disease management structure at the public BHUs presented a major barrier to the program, although establishing dedicated chronic care clinic hours somewhat mitigated this problem in Vitoria da Conquista. However, clinic during working hours primarily attracted a female clientele (about 80 percent women), which represents another challenge faced by NCDs programs. In HRVC, the partnership with SESI allowed NCD services to industry workers in the evenings and resulted in the provision of services to patients made of 80 percent men. Discussions with the municipal secretaries of health are currently exploring the possibility of opening some facilities during the weekends to allow service delivery to gender-balanced population. Some BHU have one physician for every 8,000 people. This ratio results in the prioritization of urgent care over follow-up with chronic disease patients. Initially, the absence of an EMR system also hindered care coordination. While HealthRise made strides in addressing some of these systemic problems through dedicated clinic shifts and EMR implementation, future programs may carefully consider barriers to care outside the health system, such as access to transit, water and sanitation quality and other challenges revealed in broad population needs assessments. Program feasibility assessments should include infrastructure requirements, availability of healthcare workers, local government administrative capabilities, concurrent epidemics, and active endemic diseases.

*Poor internet network infrastructure prevented implementation of digital health interventions.* Many municipalities could not provide internet access at the BHUs despite having signed a memorandum of understanding that included this support. Projects should conduct an independent analysis of internet network infrastructure and address the need for internet access, bandwidth, and server space before developing digital solutions and procuring electronic devices.

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*“E-clinics give the same care as hospitals and time is saved.”*

*– Administrator, India*

## INDIA

### BACKGROUND

India faces a rapid epidemiological transition, with a large and growing burden of NCDs. India is located at the epicentre of the diabetes crisis and has a diabetes population of around 74 million. It is the second country after China with highest burden of diabetes<sup>8</sup> And cardiovascular disease causes the majority of deaths in India, even in rural and less developed areas.<sup>9</sup>

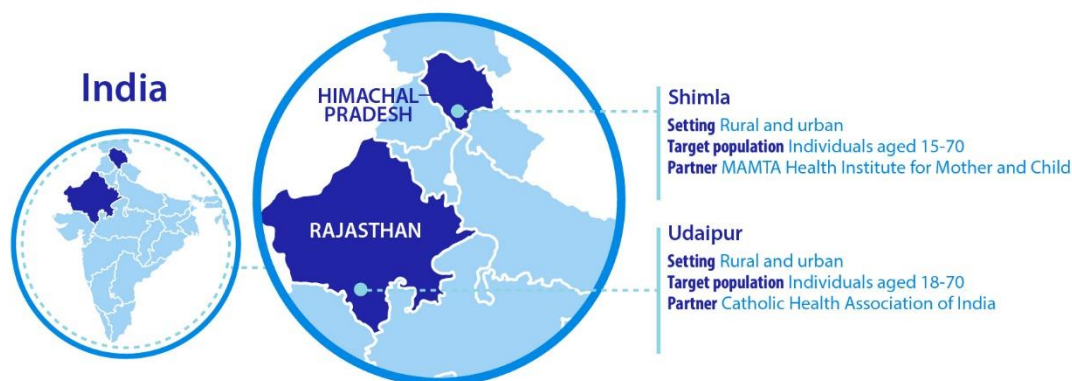
The Indian government established the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke in 2010 to tackle the growing NCD burden. By 2014, however, most states in India still had not translated national NCD policies into health services on the ground. For example, the National Programme for Prevention and Control of Cancer, Diabetes, Cardiovascular Diseases and Stroke had issued guidelines to strengthen awareness, early diagnosis, and treatment, but gaps remained in implementation in both rural and urban areas. Implementation challenges included low awareness about risk factors, health workers’ weak knowledge of symptoms and appropriate responses, and the lack of connection between community services and primary healthcare facilities.

<sup>8</sup> IDF DIABETES ATLAS Eighth edition 2017, International Diabetes Federation. URL: <https://www.idf.org/component/attachments/attachments.html?id=1405&task=download>

<sup>9</sup> Dorairaj Prabhakaran, et al., “Cardiovascular Diseases in India: Current Epidemiology and Future Directions,” *Circulation* 133, No. 16, 2016.



## Exhibit 11: India intervention areas and partners



## NEEDS ASSESSMENT AND RECOMMENDATIONS

The India needs assessment, conducted in the two HealthRise intervention areas of Shimla and Udaipur, included household surveys, health facility capacity surveys, and interviews with health officials, providers, NCD patients, and community members. Key findings included the following:

- **Prevalence**—Hypertension prevalence in Shimla and Udaipur was estimated at 33 percent and 31 percent, respectively, with prevalence slightly higher among men. Diabetes prevalence was estimated at 6 percent in Shimla and 9 percent in Udaipur.
- **Diagnosis**—Large proportions of people with hypertension and diabetes in Shimla and Udaipur had not previously been diagnosed, including approximately 60 percent of those with hypertension and 23 percent of those with elevated blood glucose levels. Patients often received their diagnosis at a higher level facility due to shortages of diagnostic testing supplies at primary health centers.
- **Treatment**—The needs assessment found that once an individual in Shimla or Udaipur is diagnosed with hypertension or diabetes, they are highly likely to receive treatment.
- **Disease control**—Among hypertension patients on treatment, 59 percent had not achieved disease control. Among diabetes patients on treatment, 40 percent had not achieved disease control.
- **Risk factors**—Large proportions of people were found to be overweight or obese in both areas: 38 percent in Shimla and 30 percent in Udaipur, with women in both areas having a much higher likelihood than men of being overweight or obese.
- **NCD awareness and patient empowerment**—The household survey found that most people were unaware of the main risk factors for hypertension and diabetes.
- **Barriers to patient access**—The needs assessment found that relatively few primary health centers and sub-centers offered NCD screening. At tertiary facilities that could diagnose and treat NCDs, overcrowding and long wait times were found.
- **Health system barriers**—Primary health centers were found to have insufficient supplies of medications needed to treat hypertension and diabetes.

**Recommendations.** Recommendations focused on promoting diagnosis and long-term medication adherence, and on strengthening the capacity of primary and secondary care facilities to provide NCD diagnosis, treatment and disease management services. Specific suggestions for the India HealthRise programs included the following:

1. **Increase patient awareness** of the disease symptoms and risk and the importance of routine check-ups, in order to increase diagnosis.
2. **Strengthen capacity for decentralized screening and community outreach**, including by empowering accredited social health activists (ASHAs, a type of community health worker in India).
3. **Collaborate with supply-side partners** to ensure a reliable supply of equipment and pharmaceuticals at lower level health facilities, and to enhance formal patient support.

## PROGRAM DESIGN

HealthRise chose two local partners, Catholic Health Association of India (CHAI) in Udaipur district and MAMTA Health Institute for Mother and Child in Shimla district. Each partner connected with local governments, community-based organizations, academic centers, and private companies in their region to launch a comprehensive and sustainable approach to diabetes and hypertension screening and management.

The community programs responded to the needs assessment findings and recommendations by implementing the following activities:

- **Training.** HealthRise India created a suite of training modules based on the new government guidelines on NCDs. These were used to train public sector providers and CHWs (Accredited Social Health Activists, or ASHAs and Auxiliary Nurse Midwives, or ANMs) in NCD screening, counseling, follow-up, and disease management.
- **Patient awareness.** Both local partners engaged communities through street plays, radio campaigns, and other community mobilization methods in response to the population's low awareness of the signs and symptoms of diabetes and hypertension.
- **Screening.** The partners organized screening camps in villages and local health facilities, staffed by government health workers and outreach workers hired by the project. The government health workers included ASHAs and auxiliary nurse midwives.
- **Referral.** Partners supported referral for patients to confirm diagnosis at the nearest health facility. To further promote diagnosis, the outreach workers checked health center patient visit records against a screening camp database to see which referred patients had not yet made a diagnostic visit. They then visited those patients' homes to encourage them to seek care.
- **Treatment and follow-up.** Over the course of 15 months, outreach workers and ASHAs conducted four to five home visits per patient to check adherence to treatment, encourage attendance at routine clinic visits, and provide health education and counseling.

- Disease management.** To promote better wellness choices and adherence to treatment, HealthRise India initiated patient support groups for diabetes and hypertension patients, their family members, and community stakeholders. These groups went beyond individual action to catalyze community initiatives to address NCDs. One example of community action included self-organized patient support groups for periodic monitoring of blood sugar and pressure and physical activity such as yoga. As an experiment, five of 62 villages in Udaipur and 14 out of 400 villages in Shimla that were part of the HealthRise India project, received a package of focal interventions termed the Community Life Competency Process (CLCP) and SALT Technique conducted by a Belgium based organization called the Constellation. The CLCP cycle consists of several standardized community appraisal processes through which, the community expectedly demonstrates ownership of their various socio-developmental as well as health related problems and collectively innovates solutions to address them. There were 22 patients from Udaipur and 135 patients from Shimla who participated in the CLCP exercise that resulted in 86 percent and 71 percent adherence to treatment respectively.

In addition, the India HealthRise partners undertook the following innovative activities:

- Electronic health card for improved patient tracking and coordination.** To track individual data and health center referrals, HealthRise India partnered with the state government of Shimla district to develop an electronic health card system. The health card offers an integrated approach for prevention, screening, diagnosis, and control of more than 10 NCDs, including diabetes and hypertension, and makes real-time data available to providers. HealthRise India trained frontline health workers to collect data on this digital, tablet-based tool, which assisted providers in identification of at-risk patients, screening, referral, and follow up with patients for diagnosis and treatment. In addition to patient follow-up and management feature for providers, the tool was also designed to capture surveillance data on NCD risk factors and prevalence to inform government monitoring and planning of NCD programs. This was the first-ever electronic health card for NCDs in the country. The Government of Himachal Pradesh continued to scale up the implementation of the electronic health card across the entire state after the HealthRise project had ended.
- Call center and e-clinic for enhanced patient-centered care.** In Udaipur, CHAI partnered with a call center agency to call and send text messages to patients to remind them of appointments and when to take medication. Patients also contacted the call center for information on risk factors and symptoms, facility locations and appointments, and treatment options.
 

In Shimla, HealthRise partner MAMTA piloted an “e-clinic” for virtual consultations with specialists for patients living in remote areas. The e-clinic used Skype to connect patients and health workers in remote clinics with distant specialists, who were able to oversee testing, analyze test results online, and make treatment decisions.

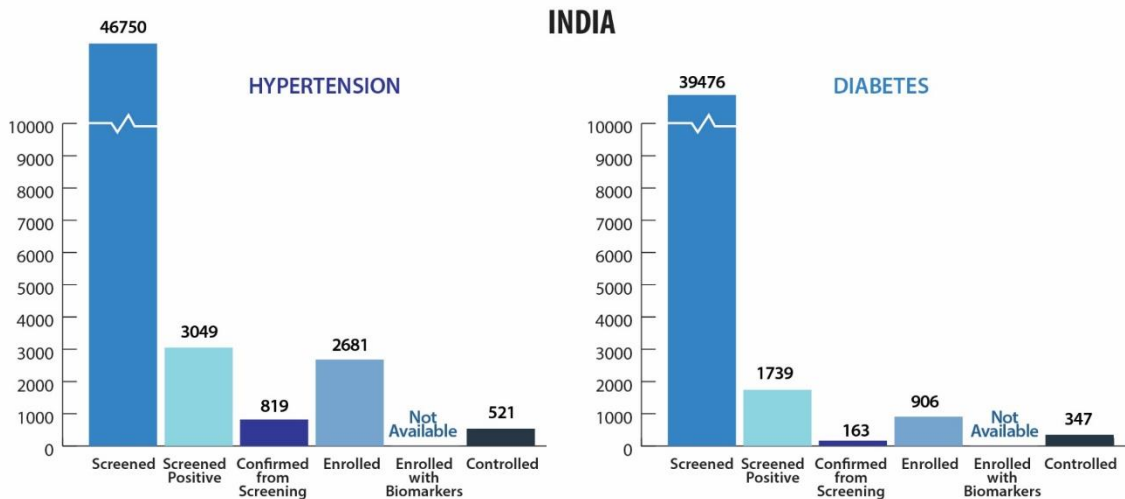
MAMTA also introduced Interactive Voice Response Service (IVRS) and developed eight audio-visuals aids on risk factors and disease management to improve knowledge of the general population on diabetes and hypertension.

## RESULTS

The evaluation results for Shimla showed that the percentage of HealthRise patients meeting treatment targets for diabetes did not differ significantly from the comparison group, with both groups at approximately 66 percent.<sup>10</sup> Patients with hypertension in the comparison group had higher rates of control (about 58 percent) than HealthRise patients (about 45 percent). The endline evaluation for India relied on cross-sectional data from non-random samples and was unable to compare values from baseline to endline.

Exhibit 12 shows program monitoring data on the number of screenings for hypertension and diabetes, the number of positive screenings, the number of those positively screened cases that received a positive diagnosis of disease, the number of cases enrolled in HealthRise programs, and the number of enrolled cases that achieved disease control. The disease control result in India differs from the other country programs because the number of patients with biomarker data was unavailable; had this data been available the percentage of patients with controlled disease might be higher. The yield rate for confirmed diagnosis out of the number of patients screened positive is relatively low.

**Exhibit 12: Cascade of care results, India**



Additional quantitative results from the India HealthRise projects show that:

- 464 public screening events were held
- 1,847 health workers received training, including 1,016 ASHAs (CHWs)
- 16,286 household visits were conducted in Shimla (data not available for Udaipur)
- More than 6,000 patients attended support groups

<sup>10</sup> Endline evaluation results were unavailable for Udaipur.

The HealthRise endline evaluation also produced notable qualitative results, discussed below:

**Earlier diagnosis.** The evaluation found that patients in comparison facility groups were more likely to report having been diagnosed with a NCD after they became symptomatic compared with intervention site patients, who had a greater tendency to report becoming aware of their diagnosis as a result of visiting a screening camp.



*“The [CHWs] are not people from outside, but they are people among us.”*

*– HealthRise patient, India*

**Referral.** Evidence from the HealthRise evaluation suggests that the new referral system, in which outreach health workers checked whether referred patients had gone to the clinic for a confirmatory diagnosis—and went to their homes to talk with them if they hadn’t—was a success. As one patient noted, “The [CHWs] are not people from outside, but they are people among us.” According to the evaluation, clinic-based providers noticed marked increases in NCD patient volumes after the start of HealthRise.

**Improved patient tracking.** The HealthRise evaluation found strong awareness of the health cards among patients, and high use of the app among both clinic-based workers and CHWs. The Prime Minister of India selected it for an Excellence in Innovation award and featured it in his recent book. The health card app has been integrated into government-funded activities, ensuring the sustainability of this effective tool.

## KEY TAKEAWAYS AND TECHNICAL INSIGHTS

*Engaging national, state, and local governments from the outset increased impact and sustainability.* In India, the national government sets health policy and guidelines, while health services planning, and implementation take place at the state level. District governments support local health facilities, and village committees play a key role in community engagement. HealthRise India deliberately partnered with each level of government from the outset to align program objectives and lay the foundation for scaling up successful interventions.

This approach was praised during the endline evaluation of HealthRise, with interviewees pointing to the strong relationship established with the government as essential for ongoing activities. As a result of this close collaboration, the government has adopted several



HealthRise innovations and approaches. The health card tool and screening camp model have been integrated into government-funded activities, and the government is pilot-testing virtual consultations for patients in remote locations.

*Using multiple modalities for patient follow-up increased efficiency and reach of efforts.* To understand individual patient barriers to care and improve health-seeking behavior, HealthRise India conducted home visits, followed up with patients via mobile phone, and monitored health center records. Each method on its own might not have yielded the same results. Not all patients had mobile phones, and home visits to all lapsed patients including those who needed only a text prompt, might have increased program costs.

Programs should also consider a gender-based strategy for outreach to different populations, and consider any seasonal adjustments required. For example, MAMTA found it more difficult to engage men in screening activities. Many patients also depended on apple-picking season for their livelihoods and could not attend screenings or follow-up visits during this time.

*Providers appreciated training and requested more.* During the HealthRise India evaluation, CHWs in particular reported gaining substantial new knowledge through the HealthRise trainings. However, both they and clinic-based providers said that they would also like refresher trainings to reinforce their knowledge, hands-on learning to master practical skills, and training to improve their communication skills with patients.

*Virtual consultations were an effective way to make specialist care accessible for patients in remote locations.* In areas with adequate bandwidth and internet access, virtual consultations with specialist physicians may provide more convenient and affordable access for patients. HealthRise India found that these e-clinic consultations helped patients not only quickly access the specialist care they needed, but also save on travel costs and wages lost to travel and waiting time.



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*“It’s always vital to engage local tribal leaders and understand the local politics so that they are able to assist you.”*

*– Dr. Sanele Madela, South Africa*

Photo Credit: Medtronic Foundation

## SOUTH AFRICA

### BACKGROUND

The burden of NCDs is growing in rural and urban areas in South Africa and increasing pressure on the health system. Despite comprehensive NCD policies since the 1990s, NCD prevalence remains high.<sup>11</sup> More than half of South African women and 30 percent of men are overweight or obese.<sup>12</sup> The HealthRise program in South Africa supported the country’s reengineering of its healthcare system to move towards a model of integrated care for all and shift greater attention to diagnosis and management of chronic conditions like hypertension and diabetes.

HealthRise South Africa was implemented in two locations: uMgungundlovu district in KwaZulu-Natal Province and Pixley Ka Seme district in Northern Cape province. Kwazulu-Natal is the most populous province in South Africa with a diverse population comprising 84.9 percent Black Africans, 8.5 percent Indian, 5.1 percent White and 1.5 percent Colored. This province has the highest HIV prevalence in the country with over a quarter of its population living with the disease. High TB rates also persist. Moreover, unemployment for working age adults is at roughly 25 percent and in rural areas such as uMgungundlovu district where 19 percent of those 20 and older have had no formal education. Rural populations face significant geographic challenges to reach healthcare facilities in these areas<sup>13,14</sup>. The Northern Cape is South Africa’s largest province with inhabitants consisting of Colored (57.7percent), Black African (33.2 percent), and White (8.0 percent). Relatively to other regions of the South Africa, rural populations in this province live under extreme poverty and are severely impacted by social determinants of health. Economic growth in Pixley ka Seme district is low, in part hampered by the arid climate and high levels of

<sup>11</sup> Catherine Ndinda, et al., “The evolution of non-communicable diseases policies in post-apartheid South Africa,” *BMC Public Health* 18, suppl. 1, 2018.

<sup>12</sup> Thandi Puoane, et al. Obesity in South Africa: the South African demographic and health survey. *Obesity Research* 2002.

<sup>13</sup> Naomi Massyn, et al., “District Health Barometer 2012/13,” Health Systems Trust, 2013.

<sup>14</sup> Naomi Massyn, et al., “District Health Barometer 2014/15,” Health Systems Trust, 2015.

poverty rate (43.5 percent), youth unemployment rate (37.2 percent), and high instances of crime and alcohol abuse. Patients often have trouble accessing healthcare in the sprawling region with limited transportation infrastructure, and public health facilities are not always adequately equipped or prepared to address the chronic care needs of patients who may suffer from socioeconomic challenges such as poverty or addiction.

### Exhibit 13: South Africa intervention areas and partners



## NEEDS ASSESSMENT AND RECOMMENDATIONS

The South Africa needs assessment, conducted by IHME, included an analysis of existing studies; data collection at health facilities in both districts; and interviews with patients, community members, health providers, health facility managers, and NGO employees in both districts.

- Prevalence**—At approximately 50 percent (46.8 percent in uMgungundlovu and 51 percent in Pixley ka Seme), hypertension prevalence in the South Africa intervention districts was higher than in any of the other HealthRise program sites. Diabetes prevalence was estimated at 11 percent in uMgungundlovu and 9.7 percent in Pixley ka Seme. Prevalence of both conditions was found to increase with age.
- Diagnosis**—Roughly half of people living with hypertension were undiagnosed in both uMgungundlovu and Pixley ka Seme. For diabetes, 25 and 10 percent of those with positive diabetes biomarkers were undiagnosed in uMgungundlovu and Pixley ka Seme, respectively.
- Treatment**—The needs assessment found that the majority of patients who had received a diagnosis of either hypertension or diabetes had received treatment. This was true in both uMgungundlovu and Pixley ka Seme.
- Disease control**—Less than one-third of hypertension patients enrolled in care in the two districts were meeting treatment targets (30.2 percent in uMgungundlovu and 31.7 percent in Pixley ka Seme). Even smaller proportions of diabetes patients enrolled in care were meeting treatment targets (26.4 percent in uMgungundlovu and 9.4 percent in Pixley ka Seme).

- **Risk factors**—Being overweight and obesity were the most prevalent risk factors for NCDs in the two HealthRise districts. Rates of physical inactivity were also high, at roughly 40 percent in both districts.
- **NCD awareness and patient empowerment**—Patients and community members had low awareness of the signs and symptoms of NCDs. Further, most did not know that conditions like hypertension and diabetes may not have symptoms in their early stages. The needs assessment also indicated that patients tend to delay seeking diagnosis and care until their symptoms are severe. Interviewees noted that poverty stands in the way of eating healthier foods and getting regular check-ups.
- **Barriers to patient access**—Patients reported lack of transportation to health facilities and long wait times at the facilities. Care-seeking is also inhibited by people’s fear of learning they have HIV, concerns about confidentiality and discrimination, and distrust of clinic personnel. Although community members voiced respect for community care givers, these health workers had limited ability to diagnose and monitor NCD patients.
- **Health system barriers**—The needs assessment found that provincial health clinics and community health centers lacked proper tests and good quality equipment for diagnosis and continued monitoring of NCD patients. Facilities also had low staffing levels and high volumes of patients, resulting in little time for providers to counsel their NCD patients.

**Recommendations.** Recommendations arising from the needs assessment included the following:

1. **Address barriers to access** by training and equipping community care givers to diagnose and monitor NCDs.
2. **Increase diagnosis** by implementing a population-wide screening program using community care givers in coordination with facility-based care.
3. **Address staffing shortages** at health facilities.
4. **Empower patients** to understand and monitor their conditions through support groups, expanded counseling from providers, increased access to monitoring equipment, and/or improved awareness of disease status and treatment.

## PROGRAM DESIGN

HealthRise South Africa selected a local partner in each of the locations. Expectra Health Solutions (Expectra) led implementation in uMgungundlovu district and Project HOPE led activities in Pixley Ka Seme district. The Human Sciences Research Council managed the overall country program, including helping to select the local partners. The project team chose these local partners because of their track record in implementing health programs in the provinces, and their innovative proposals to increase screening, diagnosis, and control of diabetes and hypertension in underserved populations.

From program inception, the HealthRise program involved government representatives, community stakeholders, and other key partners in design and implementation to ensure alignment with government priorities and draw on experiences related to existing NCD programs in South Africa. The overarching strategy centered on integrating NCD and HIV



services into primary care platforms, connecting patients to the emerging National Health Insurance coverage scheme, and making linkages with the Central Chronic Medicine Dispensing and Distribution system.

The community programs responded to the needs assessment findings and recommendations by implementing the following activities:

- **Screening.** Trained community and clinical health staff conducted community screening events, door-to-door campaigns, workplace screening, and events that welcomed walk-ins to health facilities. For the first time, community caregivers used digital blood pressure machines and glucometers for screening. Everyone screened received health information on diabetes, hypertension, and related lifestyle risk factors.
- **Referral.** Health workers referred patients whose screening pointed to potential hypertension or diabetes to their nearest public health clinic to confirm diagnosis and, if necessary, obtain follow-up care. CHWs also collaborated with a focal point at the clinics to identify screened patients who had not reached the health clinic and made phone calls or home visits to encourage the patients to continue care and treatment.
- **Training and equipping CHWs.** Expectra and Project HOPE contributed to the evidence base that CHWs can perform screening and monitoring for diabetes and hypertension using glucometers and digital blood pressure machines. The HealthRise South Africa program trained more than 400 CHWs in screening and patient follow-up and provided them with backpacks with screening equipment. The training sessions provided a step-by-step approach on how to perform risk assessments, and documented the process for linkage to care, follow-up, and management of urgent/emergency readings. This training and equipment allowed the CHWs to bring screening and follow-up care directly to patients in their homes.
- **Mentorship to strengthen provider capacity.** Project HOPE partnered with the Diabetes Education Society of South Africa to identify 25 nurse leaders in six health facilities within the Emthanjeni sub-district to serve as clinical nurse mentors. A four-day mentorship training, complemented by on-the-job mentoring, improved the nurses' knowledge and practice of diabetes and hypertension care and treatment. The nurse mentors then served as resources for other health providers in their facilities and launched journal clubs and professional development workshops. Through these clubs and workshops, health professionals discussed clinical management challenges and advances in the field.
- **Patient empowerment.** In addition to providing NCD information at screening events, the HealthRise South Africa projects offered patients both standalone and integrated support groups focused on topics such as nutrition, fitness, and adherence to medication. To further support patients in their care journey, the groups welcomed patients' family members so that they, too, could learn and then offer sustained encouragement for patients to adopt healthier lifestyles, adhere to treatment, and develop resiliency.
- **Social Determinants of Health (SDOH).** To alleviate some of the food insecurity faced among patients in Pixley Ka Seme and to promote healthy eating, Project HOPE helped

to establish community gardens at health facilities in partnership with the department of agriculture. Furthermore, to support economic opportunities and augment financial literacy, village savings loans programs were rolled out in the same district.

- **Patient empowerment and peer groups:** Expectra helped establish support groups for hypertension and diabetes and linked each of them to a nurse and specialized experts to provide guidance in diet, optometry, and physical activity. Project HOPE implemented a five-step program for patients to learn more about diabetes and hypertension management and available health services, and to explore self-care and lifestyle improvements. The five steps covered health education on hypertension and diabetes, how to interpret blood pressure and blood glucose values, nutritional practices, exercise, and availability of relevant health services, including optometry, podiatry and mental health services. To address underlying social determinants of health affecting the enrolled patients, such as poverty and food insecurity, Project HOPE expanded its supportive services to include community gardens at health facilities and village savings loans programs to support economic opportunities.

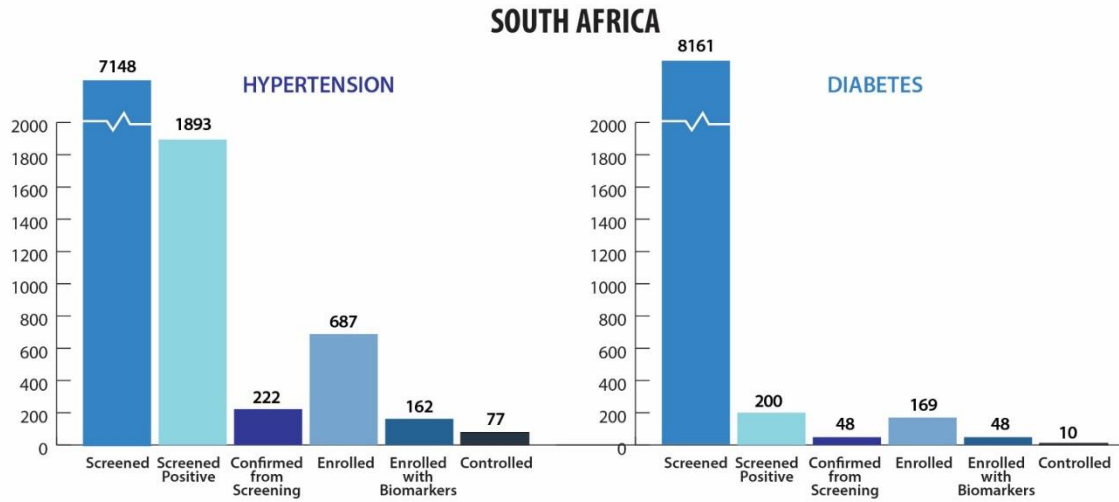
## RESULTS

The evaluation showed that the percentage of HealthRise patients meeting treatment targets for hypertension and diabetes did not differ significantly from the comparison groups. Approximately 55 percent of HealthRise patients with hypertension in Pixley ka Seme met control targets versus about 42 percent in the comparison group, and approximately 37 percent versus 39 percent in uMgungundlovu. For diabetes, about 60 percent of HealthRise patients met treatment targets compared to approximately 53 percent in the comparison group in Pixley ka Seme.

Approximately 53 percent of HealthRise patients with diabetes in uMgungundlovu met treatment targets versus about 48 percent in the comparison group. (The confidence intervals were large across sites and disease states due to the small sample sizes.) The endline evaluation for South Africa relied on cross-sectional data and was unable to compare values from baseline to endline.

Exhibit 14 shows program monitoring data on the number of screenings for hypertension and diabetes, the number of positive screenings, the number of those positively screened cases that received a confirmed diagnosis of disease, the number of cases enrolled in HealthRise programs, the number of enrolled cases for which biomarker data was available, and the number of controlled cases out of patients with biomarker data. The program saw relatively low yield in the number of patients with a confirmed diagnosis out of those screened positive. A high percentage of patients also dropped out of care for hypertension and diabetes between enrollment and routine biomarker measurement.

**Exhibit 14. Cascade of care results, South Africa**



Additional quantitative results from the South Africa HealthRise projects show that:

- 8,713 public screening events were held, including workplace, household, and support group screening events.
- 778 health workers<sup>15</sup> received training, including 596 CHWs and community care givers.
- 66 support group meetings were held.

Notable qualitative findings from the HealthRise endline evaluation included the following:

**Community care givers.** The evaluation provided evidence suggesting that CHWs and community care givers had made a valuable contribution, with both health facility staff and patients expressing enthusiasm for using these cadres to improve access and quality of care.

**Support groups.** The evaluation also found enthusiasm among facility staff and patients for the establishment of support groups focused on NCDs and clubs for group exercise and other healthy activities. This enthusiasm for support groups and clubs may have been driven by staffs’ and patients’ own recognition—also expressed during the evaluation—that patients had difficulty following diet and exercise advice. Partners attempted to use the Diabetes Empowerment Scale for longitudinal assessment of patient empowerment however this was unsuccessful as some questions were not relevant and culturally inappropriate.

**Health awareness.** The endline evaluation uncovered a desire among both health facility staff and patients for more health education activities and health promotion messaging in communities and clinics.

<sup>15</sup> Health workers trained included program support implementers as well as health facility staff and CHWs/community caregivers.

**Diagnosis and retention in care.** The evaluation provided qualitative evidence suggesting that a key barrier to patients' obtaining confirmatory diagnosis and follow-up care was the long distance to health facilities. Transportation difficulties were the most frequently cited problem by interviewees. Patients said they found it difficult to find and pay for transport to health facilities, while clinic staff described challenges to reaching patients in their communities. As one patient noted, "I personally skip some appointments when I do not have transport money or money for food because you can't come to the clinic on an empty stomach". During the evaluation, interviewees suggested expanding the use of mobile clinics and community care givers to deliver services in rural communities.

**Staffing and other facility needs.** The South Africa endline evaluation suggested that health system weaknesses identified during the baseline needs assessment continued to stand in the way of successful service delivery throughout HealthRise implementation. Facility staff and patients cited staff shortages, medication stock outs, missing or broken diagnostic equipment, and poor facility infrastructure as major barriers to care.

## KEY TAKEAWAYS AND TECHNICAL INSIGHTS

*Pursuing partnerships beyond the health sector paid off.* In addition to forming partnerships with the local health department and primary health facilities, HealthRise South Africa reached beyond the health sector to garner support from community-based organizations and from other government departments. For example, through community collaboration Expectra identified and trained unemployed youth on the use of glucometers and blood pressure equipment, to build a pool of volunteers for NCD screening who could link patients to facility-based care. After training these volunteers were recruited to work for the project and received a monthly stipend from Expectra. Project HOPE received donated seeds and tools for the community gardens from the Department of Agriculture to promote healthy eating. It also worked with Nightingale Hospice, a local nonprofit with close ties to community members, to expand the reach of its health education and screening programs.

*Facility-based delivery was a barrier to retention in rural populations.* HealthRise implementers observed that long distances to health facilities and travel costs prevented patients from receiving a diagnosis after screening or follow-up care. As mentioned above, these barriers to retention showed up prominently in the South Africa endline evaluation. Future program designers may wish to consider expanding the use of mobile clinics and community care givers to deliver services in rural communities, as suggested by interviewees who participated in the HealthRise evaluation.

Also related to transportation barriers, the South Africa community gardening program targeting the social determinants of health did not sustain its initial momentum due to long distances that patients had to travel to participate. This suggests that in settings where health facilities are located far from where many patients live, it would be more appropriate to implement such interventions within the communities themselves rather than at health centers.

*Weak health systems impeded delivery of care.* As noted in the results section above, health system weaknesses—including staff shortages, medication stock outs, missing or broken diagnostic equipment, and poor facility infrastructure—remained a persistent challenge throughout HealthRise implementation. These issues were not unique to the HealthRise districts, with staff and patients at the evaluation comparison facilities describing the same challenges. This suggests that scale-up of NCD programming in South Africa will require a strong focus on health systems strengthening to support recent initiatives such as integrated chronic disease management, the re-engineering of primary healthcare platforms, National Health Insurance, and the Central Chronic Medicine Dispensing and Distribution system.

*HIV stigma made people wary of diabetes screening.* CHW feedback from door-to-door screening indicated that most people screened for diabetes in their homes did not initially accept the finger-prick test for the glucometer until reassured that the CHW would not test for HIV. This finding may have implications for any plans to integrate HIV and NCD screening.





HealthRise 





*“The support from this program gives me hope that she will be with me longer.”*

*– Patient family member, U.S.*

Photo Credit: Medtronic Foundation

## UNITED STATES

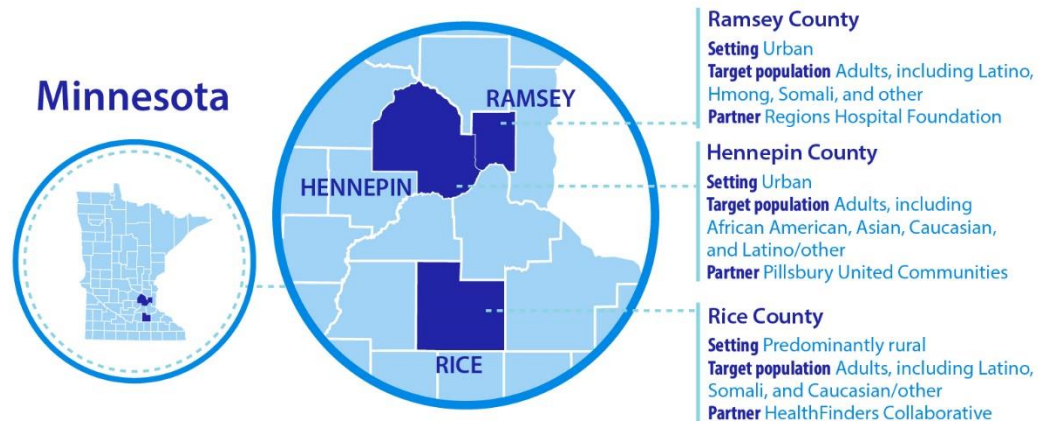
### BACKGROUND

While the state of Minnesota ranks relatively high in life expectancy and health outcomes compared to other U.S. states, it nevertheless faces disparities in health outcomes. Approximately 10.5 percent of Minnesotans have diabetes and another 35.1 percent are at risk.<sup>16</sup> Diabetes is also the sixth leading cause of death in the state, and minorities, people with low incomes, and the elderly are disproportionately affected. Among people with diabetes, 31 percent also have heart disease, the second leading cause of death in Minnesota.<sup>17</sup>

The HealthRise U.S. program implemented an innovative approach to improve health outcomes associated with diabetes and hypertension among underserved populations in three counties with a lower proportion of the population meeting clinical targets. These counties—Ramsey, Hennepin, and Rice—also had a higher proportion of people uninsured, underinsured, or dependent on forms of Medical Assistance, Minnesota’s Medicaid program.

<sup>16</sup> American Diabetes Association, “The Burden of Diabetes in Minnesota.” Retrieved from <http://main.diabetes.org/dorg/PDFs/Advocacy/burden-of-diabetes/minnesota.pdf>.

<sup>17</sup> Minnesota Department of Health, Health Promotion and Chronic Disease Division, Office of Statewide Health Improvement Initiatives, “Chronic Diseases and Their Risk Factors in Minnesota: 2011,” 2011. Retrieved from <http://www.health.state.mn.us/divs/hpcd/do/HPCDtrendreport2011.pdf>.

**Exhibit 15: United States intervention areas and partners****NEEDS ASSESSMENT AND RECOMMENDATIONS**

The United States needs assessment examined 13 areas in the three HealthRise intervention counties with the goal of pinpointing the areas and populations in greatest need of NCD-related health services. Key findings included the following:

- **Prevalence**—Based on self-reporting of diagnosis, hypertension prevalence ranged from 11 to 26 percent across the examined sub-counties. Self-reported diabetes prevalence ranged from 3 to 9 percent. Hypertension and diabetes prevalence were approximately the same for men and women, based on this self-reporting.
- **Co-morbidity**—Over 30 percent of individuals across the three counties had more than one NCD-related condition.
- **Treatment**—Data indicated that once individuals in the three counties got diagnosed, most receive care. The percentage of individuals who had received any medical care in the preceding year ranged from 54 to 86 percent across the 13 areas surveyed.
- **Disease control**—In geographic areas with the poorest outcomes, 72 to 79 percent of vascular patients were meeting hypertension targets, compared with 93 to 100 percent of patients in the best-performing areas. For diabetes, 59 to 68 percent of patients were meeting diabetes targets in the geographic areas with the poorest outcomes, compared with 80 to 90 percent in the best-performing areas.
- **Barriers to patient access**—Poor access to care was found to be common across the regions, with interviewees in Rice and Hennepin counties citing high costs and lack of health insurance as the main barriers. Other barriers identified during the needs assessment included language barriers and lack of culturally relevant health education for recent immigrant communities; transportation and time challenges for low-income communities; difficulty maintaining steady contact with the health system among homeless and itinerant populations; and difficulty sustaining needed lifestyle changes and regular schedules with providers among those with mental health comorbidities.

**Recommendations.** Two key recommendations arose from the needs assessment:

1. **Reach areas of highest need** by targeting geographic hotspots where disease prevalence is higher and the proportion of patients meeting clinical targets is lower.
2. **Improve achievement of clinical targets** for people in care.

## PROGRAM DESIGN

Three different entities—Regions Hospital Foundation, Pillsbury United Communities (PUC), and HealthFinders Collaborative (HFC)—led implementation in their respective counties in Minnesota. The project team shaped the model to meet the needs of the patients in each community and to fit the structure and operations of each organization. Broadly, the three main program components included strengthened healthcare delivery in the community, extended care from the clinic into the patient’s home, and a holistic response to patient needs and barriers. Unlike the programs in Brazil, India, and South Africa, the U.S. HealthRise projects did not incorporate a screening component, choosing instead to primarily work with patients who were referred into the program by primary providers and who consented to enroll.

The county programs implemented the following activities:

- **Referral.** Primary care providers referred eligible patients with a diabetes or hypertension diagnosis to a program lead or community health worker, who then upon the patient’s consent enrolled them in the HealthRise program. Some local partners also tested patient referral by community paramedics after a home visit or the use of community-based events to recruit patients for the program.
- **Home-based care, patient-centered services and follow-up.** Once enrolled, patients developed individual care plans with their joint clinical and community care team and received home visits. The patients also had access to numerous health education and wellness programs tailored to their culture, language, and community context.

The Minnesota HealthRise partners also undertook the following innovative activities:

- **Novel community workforce.** HealthRise integrated CHWs and community paramedics into enrolled patients’ care teams. Bringing medical expertise and equipment, community paramedics performed vital sign monitoring, blood glucose measurement, and medication reconciliation in the homes of high-risk patients, and interfaced with physicians, nurses, and pharmacists to adjust patient care plans as needed.

CHWs were nonclinical team members who focused on social and cultural aspects of patients’ health. They provided language and cultural support to community paramedics during home visits and helped the broader care team understand the cultural norms and needs of HealthRise patients. In addition, the CHWs provided patient education services; assessed patients’ situations related to food, transportation, health insurance, housing, and other social determinants of health; and connected patients with community-based resources to meet those needs. HealthRise implementers found that CHWs’ style of engagement, compassion, and status in the community as trusted individuals allowed information about



self-management of chronic disease to resonate in transformative ways for patients. Extending care into patients' homes helped the whole care team more fully understand their patients' environment and circumstances, learn the roots of their health challenges, and co-create individual plans for better health.

- Improved care coordination.** Management and information systems traditionally support either medical-clinical contexts or community-based human services. To overcome this separation in data systems, HealthRise sites developed structures and processes to support integration of patient-level data to lead to holistic care. For example, Regions utilized the *Pathways* tool, an electronic medical record and documentation platform to promote the care coordination of the patient across different health and social needs. HFC approached this coordination challenge by designing its own solution. From program inception, CHWs used the EMR system to document home visits within the patient medical record. The project customized medical records and templates for CHWs and for any member of the care team to document patient interaction in one location. This design allowed providers to see notes from home visits and follow care coordination efforts.

In the last year of the program, HFC implemented Care Message, an SMS-based educational message tool. HFC used this tool to send routine messages related to nutrition and wellness to patients' registered telephone numbers, and reminders to attend upcoming wellness classes. This system contributed to an increase in attendance among those enrolled.

- NCD care grocery store.** In 2017, PUC launched North Market, a full-service grocery store developed with the community in response to the expressed needs of the population, which lacked access to fresh produce. This unique social enterprise provides access to good food at affordable prices, a Wellness Resource Center in partnership with North Memorial Health, and programs in nutrition, fitness, and mindfulness. CHWs joined the interdisciplinary wellness team at North Market, alongside a nutritionist, pharmacy liaison, and program coordinator. Future research into the results and impact of this promising intervention would provide a valuable addition to the evidence base supporting its continued use and scale-up.

## RESULTS

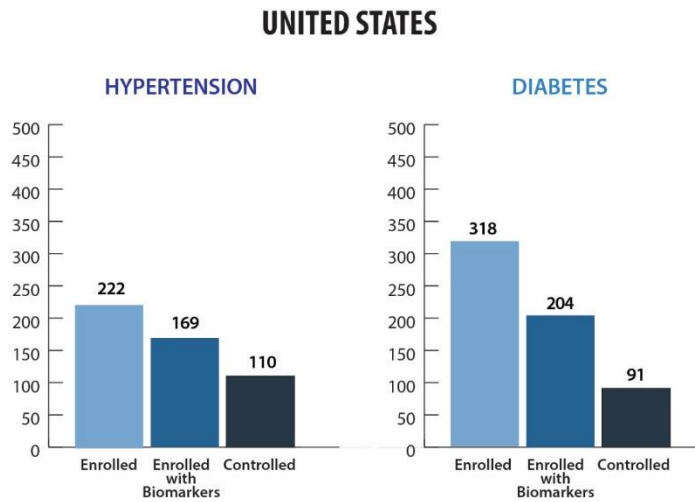
The quantitative evaluation found significant reductions in blood pressure and glucose readings in HealthRise patients, but not consistently across all three sites. HealthRise patients at endline in Ramsey saw an average SBP decrease of 14.4 mmHg and in Rice 8.4 mmHg. In contrast to the comparison group, HealthRise patients in Hennepin experienced a statistically significant increase in the percentage of patients meeting treatment targets for hypertension, approximately 24 percent. The evaluation did not find a significant difference between the comparison groups and HealthRise sites in Ramsey and Rice for hypertension.

HealthRise diabetes patients in Hennepin and Ramsey saw average A1c decreases of 0.7 and 1.4 respectively. The patients with diabetes in these counties also saw a statistically

significant increase in meeting treatment targets versus their comparison groups—about 22 percent and 19 percent respectively. The evaluation did not observe the same result in Rice.

Exhibit 16 shows the number of cases enrolled in HealthRise programs, the number of enrolled cases for which biomarker data was available, and the number of controlled cases out of patients with biomarker data. The program saw a higher rate of retention with patients with biomarkers with hypertension compared to those with diabetes. The U.S. program models did not include a screening component.

**Exhibit 16: Cascade of care results, Minnesota, United States**



Additional quantitative results from the Minnesota HealthRise projects show that:

- 33 health workers received training, including 13 CHWs.

The HealthRise endline evaluation also highlighted the following important qualitative findings:

**Value of community health workers.** Many primary care physicians had not previously worked with CHWs or community paramedics before HealthRise and did not initially see their value as part of the care team. As working relationships between the different types of providers grew, however, clinical staff came to appreciate the value added by the community workers. This change in provider attitudes was strongly evidenced in the endline evaluation, with clinical staff consistently praising this component of the HealthRise model as helping improve patient care. Interviewees said the care team model, including in-home providers, had created opportunities to deliver care that would not have been possible during the limited time of a clinical visit. Providers also noted that many patients had expressed gratitude for the extra support they received from CHWs and CPs.

**Data sharing challenges.** CHWs in Ramsey and Hennepin counties were unable to integrate data from their home visits into electronic medical systems, and mentioned these data sharing challenges repeatedly during the endline evaluation.

## SUSTAINABILITY, SCALE-UP, AND REPLICABILITY

HealthRise has united community and clinic-based resources for underserved populations and has offered the potential to provide real value to local health system partners beyond the life of HealthRise. HFC has formed partnerships with the Mayo Clinic and Allina Health System to extend the model beyond NCDs, including obstetric and gynecological care for Somali populations. HFC will also continue to employ CHWs and deliver community and clinical services to the existing HealthRise cohort.

PUC seeks to explore the value of Medicaid reimbursement for CHW services, particularly as a community-based organization committed to building capacity of this important workforce. It hopes to demonstrate higher value care at lower cost through North Rising, in collaboration with Institute for Health Metrics and Evaluation partners. PUC and North Memorial Health have also explored an enduring partnership allowing the integration of systems—for example, access to shared electronic health records to effectively document and track patient needs, goals, and outcomes.

Regions Hospital received a substantial grant from the Fred C. and Katherine B. Andersen Foundation, \$1.3 million of which was awarded to fund operations of a CP-CHW program at Regions or across the wider HealthPartners system over the next 1-2 years. The infrastructure developed, and lessons learned during the HealthRise project informed the development of this program.

## KEY TAKEAWAYS AND TECHNICAL INSIGHTS

*A short-term training curriculum could facilitate greater user of community health workers.* As discussed in the results section above, providers came to greatly value the contributions of the HealthRise CHWs. Nevertheless, training and general health system acceptance of CHWs and CPs remain nascent in the U.S. Training noncertified CHWs and getting them up to speed under HealthRise was vital, but an immense challenge. While CHWs and CPs are part of an emerging frontline health workforce in Minnesota, only a limited pool of trained personnel exists. In some cases, CHWs hired for the program did not receive certification until after the program had ended. The current certificate program is too long to allow CHWs to be functional right away. A short-term curriculum (e.g., six weeks for one day per week) delivered to CHWs, especially around diabetes, hypertension, the social determinants of health and CHW protocols, would have been ideal. In addition, earlier, more frequent discussions with clinical providers, as well as a standard, coordinated onboarding process for patient enrollment in the program, could have increased the number of referrals to the program. To this end, PUC and North Memorial Health are currently developing a cross-functional CHW and CP care team model.

*Home visits by CPs and CHWs improve patient care.* HealthRise implementers and evaluators found that relatively small investments of time and energy in patient education and support can have a meaningful impact on patients' health in both the short and long term. The information gained about patients' home environments and circumstances can often reveal root causes of problems and help patients' primary care providers and other

clinic providers serve them more effectively. Additional benefits of the Regions Hospital HealthRise model of home visits include the ability of patients and their CP and CHW to develop a strong relationship and a high level of trust, so they could address misunderstandings and culturally based beliefs about NCDs. The endline evaluation uncovered two important ideas from CHWs and CPs for further strengthening in-home visiting programs: 1) provide training modules on motivational interviewing and coping with emotionally challenging situations, and 2) identify the ideal length of time for a home visit.

*Interoperability of patient data systems posed challenges to coordinating in-home and clinic-based care.* As noted in the results section above, data sharing challenges featured prominently in the HealthRise evaluation. While HFC was able to successfully integrate the Pathways community-level patient management and tracking tool into its electronic medical records (EMR) system, Regions Hospital and PUC had a different reality to manage. CHWs at Regions Hospital and PUC used Pathways to document home visits but could not integrate the data into the EMR systems used to coordinate patient care. Lack of interoperability led to double entry of data and administrative time that CHWs and CPs would need to factor in their workload. The U.S. HealthRise evaluation found that the most commonly mentioned idea for improving HealthRise was to develop EMR software that is better tailored to care teams that include in-home providers.





HealthRise 

# CONCLUSION AND RECOMMENDATIONS

Programs to expand access to care for cardiovascular disease and diabetes among underserved populations across the globe unavoidably take place within differing social, cultural, geographic, and health system contexts, and as such must always be locally tailored. The HealthRise program, operating across nine communities on four continents, tested various ways of engaging patients in, and improving provider capacity for, screening, diagnosis, and disease management with the goal of disease control.

Because the interventions reflected and responded to local assets and challenges, the richest and perhaps most useful learnings from HealthRise can be found in the country-specific takeaways presented in the preceding chapters of this report.

Yet, certain overarching patterns emerged that can broadly inform future programs to respond to the rising tide of NCDs. The following factors played a role in the majority of local HealthRise projects, leading to a universal set of considerations and recommendations for future efforts.

**Investment in Frontline Health Workers.** Preliminary evidence suggests that regular, health-worker-initiated contact with patients, especially where they live or work, increased patient retention in the care system. Throughout the HealthRise programs, patients and providers expressed appreciation for the CHWs who regularly followed up with personalized support to people in their homes. Nowhere was the enthusiasm for this role of CHWs more apparent than in the U.S., where initially skeptical providers came away with strong endorsements for the inclusion of CHWs and CPs as essential members of care teams. In the U.S. program, household visits where individual patient needs were assessed in advance not only made for effective clinic visits but allowed some clinical care to be delivered directly in the home by the CPs. In South Africa, CHWs equipped with digital blood pressure machines and glucometers were able to take measurements during household visits and determine whether patients were adhering to treatment plans and meeting targets.

**Recommendation 1:** Additional research into the effectiveness of CHWs and CPs in increasing patient retention, and how best to integrate CHWs into local health systems, would be a worthwhile investment.

**Recommendation 2:** Support frontline health workers, including CHWs, to optimize their engagement with individuals living with NCDs and coordination with clinical care teams.

*“The global aspect is quite unique... utilizing similar strategies in different countries with very different health systems but with a similar population focus and similar workforce approaches.”*

– Policymaker, U.S.

*Empowering patients through knowledge.* Health education activities, including one-on-one discussions between health workers and patients, support groups and community mobilization, were effective in raising patients' knowledge of hypertension and diabetes, and their awareness of the importance of early detection and disease management. The HealthRise endline evaluation produced evidence of this: In India, patients reported that their health knowledge had improved since the start of HealthRise, and demonstrated good knowledge about NCD symptoms, risk factors, and basic disease management. Clinic-based providers in India also noted substantial improvements in patient knowledge about NCDs. Evidence also suggests that HealthRise patients in India presented for screening at early stages of disease compared to the comparison group.

In the U.S., clinic-based providers were enthusiastic about CHWs ability to devote the time necessary to dispel misconceptions and really help patients understand their condition—a health education function that often cannot be fit into a clinical visit. In South Africa, health facility staff and patients did not name health education as a particular strength of the HealthRise program, but rather expressed a desire for more health education activities. The endline evaluation also documented the spread of important NCD knowledge beyond HealthRise, noting instances in which the increased awareness among patients reached patients' families and communities.

**Recommendation:** Improving patient knowledge of hypertension and diabetes—including risk factors, potential complications, treatment adherence, preventive measures, and the importance of early detection—should be a part of all community-level intervention programs. The modalities and cost effectiveness of health education for patients, and whether or not it leads to people presenting for screening at early stages of disease, warrants further research.

*Target screening at community level.* The country needs assessments in Brazil, India and South Africa revealed the need to identify more undiagnosed patients, especially at earlier stages of disease, and bring them into care. The community-based screening efforts in these country programs, however, yielded relatively few patients who identified as positive out of the great number of people screened. Additionally, close follow up of patients was required which still resulted in fewer confirmatory diagnosis after the initial positive screening result.

**Recommendation:** Future programs should consider more targeted screening approaches that could identify a higher proportion of undiagnosed patients and conduct implementation research to understand the extent of approach effectiveness.

*Strengthening health systems to improve health outcomes.* Structural health system weaknesses posed the most significant barriers to confirmatory diagnosis, initiation of treatment, monitoring, and adherence. The evaluation surfaced issues such as sparse infrastructure, staff shortages, insufficient stocks of medicines and equipment, and inadequate health information systems impeded care provision. In Brazil, some basic health unit had just one physician for every 8,000 people. In India, medication stock outs and staff shortages were regarded as the primary barriers to care among both patients and facility staff. Insufficient

supplies of blood pressure and blood glucose testing equipment were also noted. The same barriers were reported in South Africa, frustrating facility staff and patients alike.

Inadequate health information and data systems, and the internet capacities that support them, also plagued health workers in one way or another in all countries. In Brazil, internet access proved unavailable at many basic health units, as well as connectivity between health facilities, such as primary, secondary and labs. In India, patient records could not be linked across visits at public health facilities, and weak or inconsistent network connectivity delayed data uploads. In the U.S., lack of interoperability prevented CHWs from writing in patient charts and impeded data sharing across electronic medical record systems, posing barriers to coordination of care. Although needs assessments conducted at the beginning of each country program took health systems capacity into account, matters of internet access and interoperability posed greater challenges than expected in many locales.

**Recommendation 1:** Future community-level intervention programs should take health systems capacity into account during the design phase and continually reassess and adapt throughout implementation. The effectiveness of strategies to mitigate these weaknesses, such as dedicated chronic care hours at clinics in Brazil, merits further investigation.

**Recommendation 2:** Governments, donors, and private-sector health systems should consider investments to ensure that health information systems used by all actors in an NCD program are integrated and interoperable, and to support community and clinic providers in using the data as part of their routine visits with patients.

*Collaboration with local, state and national government.* Efforts by local partners to communicate and collaborate with local government authorities during the early planning phases of HealthRise projects were effective in gaining government support and were a critical prerequisite to successfully carrying out many HealthRise activities. Collaboration has informed future government work on NCDs and allowed for the transition of some of HealthRise innovations and practices to public and private health system administrators for ongoing use after the end of the project. For example:

- In Brazil, where many HealthRise program interventions were integrated into the existing public health system in close coordination with municipal governments, most of these elements will sustain as the Brazilian federal Ministry of Health will continue supporting the program for at least two more years. This will include a study to generate predictive models in support of routine NCD care at the primary level, in addition to a study on scaling up diabetes and hypertension interventions in Teofilo Otoni region. In Vitoria da Conquista, public clinics will continue to provide dedicated consultation hours for diabetes and hypertension patients, and the health system will maintain implementation of a continuing education policy in NCDs for health workers.
- In India, the HealthRise health card tool and screening camp model have been integrated into government-funded activities, and the government is pilot-testing virtual consultations with physicians to increase access for patients in remote locations.

- In South Africa, a HealthRise-created database of people living with hypertension and diabetes in the Pixley ka Seme district will be available to the district health department for ongoing patient tracking and monitoring.

**Recommendation:** Community-level intervention programs should plan to develop relationships at each level of government from the beginning to ensure alignment with local priorities, integration within existing infrastructure and health systems in order to close the gaps in service delivery and enhance primary care services for underserved populations. Adopting such strategies will ultimately lead to success and sustainability of health interventions and programs.



# HealthRise



Brazil



India



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United States

