



Training in simplified echocardiography for specialized NCD nurses who lead integrated care teams providing chronic care services for rheumatic heart disease and other severe NCDs (PEN-Plus) at first-level hospitals in Rwanda.

Progressive Decentralization and Integrated Care Teams – Keys to Bridging the Gap in Services for NCDs and Injuries

Non-communicable diseases and injuries (NCDIs) account for a large and growing proportion of the burden of disease in all World Health Organizations (WHO) regions, including in low- and lower-middle-income countries (LLMICs). Among the world's poorest billion people, NCDIs cause almost 800,000 deaths under the age of 40 every year – more than HIV, tuberculosis, and maternal deaths combined.

Proven, cost-effective, and equitable NCDI interventions exist that could save millions of lives each year, if scaled to reach everyone in need. But in many LLMICs, these interventions are available only at referral hospitals in capital cities, which makes them inaccessible and unaffordable for the rural poor.

The key to achieving both Universal Health Coverage and Sustainable Development Goal targets for reducing mortality from NCDIs is to develop and implement strategies for progressive decentralization and integrated service delivery that can deliver these interventions, with quality, at lower levels of the health system and in rural areas.

3 Keys to Bridging the Gap in Delivery of NCDI Services

Lead with Equity

by prioritizing equitable, cost-effective interventions that reduce avoidable death and suffering among poor children and young adults

Decentralize Progressively

to bring prioritized services within reach of the highest-risk individuals and fill gaps in trained staffing, supply chains, and referral pathways

Integrate Services

based on shared workflow patterns, competencies, and infrastructure, as a way to optimize efficiency and quality while increasing access



Aldophmy Joseph
Haiti
17 years old
Type 1 diabetes

“Because I did not have money to follow a proper diet, every time I ate, it [my blood sugar level] went high. It was always going up all the time.

“I started getting some insulin and it went down. I keep my insulin at my aunt’s house in a refrigerator, because they have electricity and we don’t have electricity here.

“I’m always scared because they told me there is no cure for this illness and I have to live with it, but if I go on a diet and watch what I eat, I will be able to control it.”

The Problem –

lack of availability, access, and quality of NCDI services at lower levels of the health system in low- and lower-middle-income countries

The crushing – and avoidable – burden of NCDIs

Noncommunicable diseases and injuries (NCDIs) account for 60% of the burden of disease in low- and lower-middle-income countries (LLMICs).

The rising share of the burden of disease attributed to NCDIs has often been characterized as a looming epidemic of “lifestyle diseases” associated with economic development. But *The Lancet* NCDI Poverty Commission found that more than two-thirds of the burden of NCDIs among the world’s poorest billion people is not attributable to modifiable behavioral and metabolic risk factors. Furthermore, the reality is that the burden of NCDIs – and particularly the

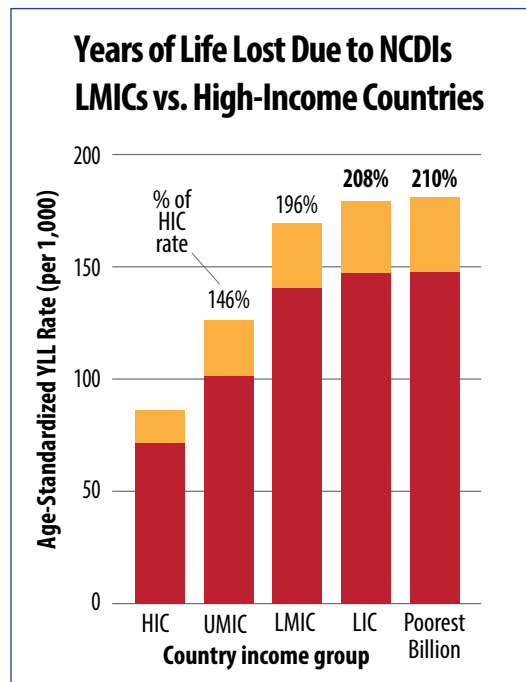
burden of death at young ages – is far higher in LLMICs than in high-income countries. Rates of years of life lost (YLLs) among the world’s poorest billion people – and in the LLMICs where they live – are more than twice as high as in high-income countries. (See figure.)

It doesn’t have to be this way. *The Lancet* NCDI Poverty Commission also found that three-quarters (74%) of years of life lost (YLLs) accrued before the ages of 40 among the poorest billion are avoidable as compared with high-income countries. (See figure.)

Avoidable burden, effective solutions

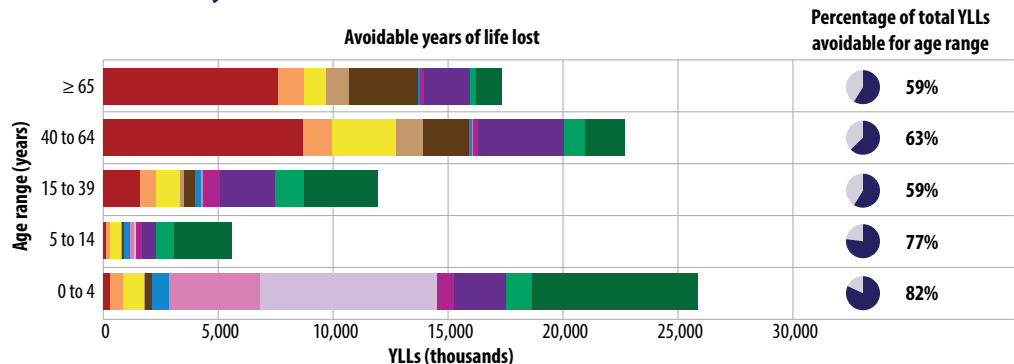
The sizable NCDI burden that is avoidable reflects the fact that the poorest populations – more than 90% of whom live in rural areas in sub-Saharan Africa and South Asia – lack access to dozens of proven NCDI interventions that are routinely available in high-income countries. Working with the Disease Control Priorities Project, the Commission identified 183 health-sector interventions for NCDIs for which implementation in LLMICs is feasible, cost-effective, and equitable.

The 45 interventions that rated most highly for both equity and cost-effectiveness include prevention, medical management, curative treatment, surgery, and palliative care for a wide range of conditions, delivered at all levels of the health system. (See figure page 3). Yet 16 low- and lower-middle income countries that established national NCDI Poverty Commissions found that many of these interventions are only available at referral hospitals in capital cities.



NCDs and Injuries of Poverty: Avoidable Years of Life Lost (YLLs)

- Ischemic heart disease & stroke
- Other cardiovascular disease
- Cancer
- Diabetes
- Chronic respiratory disease
- Sickle cell disease and other hemoglobinopathies
- Congenital heart anomalies
- Other congenital birth defects
- Mental, neurological, and substance abuse disorders
- All other NCDs
- Road traffic injuries
- All other injuries



Strategies for decentralization of NCD services

For over a decade, WHO has supported expanding delivery of care for people with chronic NCDs beyond referral hospitals by standardizing integrated service delivery models for primary health facilities. In 2010, WHO introduced the Package of Essential NCD (PEN) interventions for primary health facilities in low-resource settings. WHO's Global Action Plan for the Prevention and Control of NCDs, which was published in 2013 and updated in 2017, recommends 42 interventions and highlights 17 "best buys" as priorities for implementation in low-resource settings.

Both the WHO PEN package and the GAP "best buys" focus mainly on intersectoral and health sector measures for prevention and management of common NCDs, including uncomplicated hypertension and high vascular risk, type-2 diabetes, chronic respiratory diseases, and identification and referral of breast and cervical cancer.

In 2019, [WHO AFRO convened a regional consultation](#) to review progress on implementation of WHO PEN and develop a regional strategy for a complementary package (PEN-Plus) to deliver chronic care for more severe NCDs such as type 1 diabetes, rheumatic heart disease, and sickle cell disease through integrated care teams at first-level hospitals.

The challenge of accessibility

Yet analyses of Service Provision Assessment (SPA)

surveys in 16 LLMICs with high concentrations of people living in extreme poverty that are participating in the NCDI Poverty Network found low availability of the medications, equipment, and trained staff required to treat both common and severe NCDs at health centers and first-level hospitals alike.

A stakeholder group convened by the Malawi Ministry of Health to inform an operational plan for progressive decentralization and integration of services found that less than 5% of both health centers and hospitals in rural areas reported availability of essential medicines and equipment to treat acute and chronic asthma, hypertension, heart failure and rheumatic heart disease, and type 1 diabetes, or to provide palliative care. Less than 10% of health centers and less than a third of hospitals reported availability of staff trained to treat type 2 diabetes, cardiovascular disease, and chronic respiratory disease.

Overall, SPA data indicate that in many LLMICs a majority of primary facilities lack the medications, equipment, and trained staff to provide the WHO PEN interventions, never mind the dozens of more complex NCDI interventions identified as essential for UHC.

The challenge then is how to prioritize and effectively deliver this heterogenous set of interventions, with quality, and make them accessible and affordable for the people who need them most -- particularly in countries that face significant human resource and infrastructure constraints.



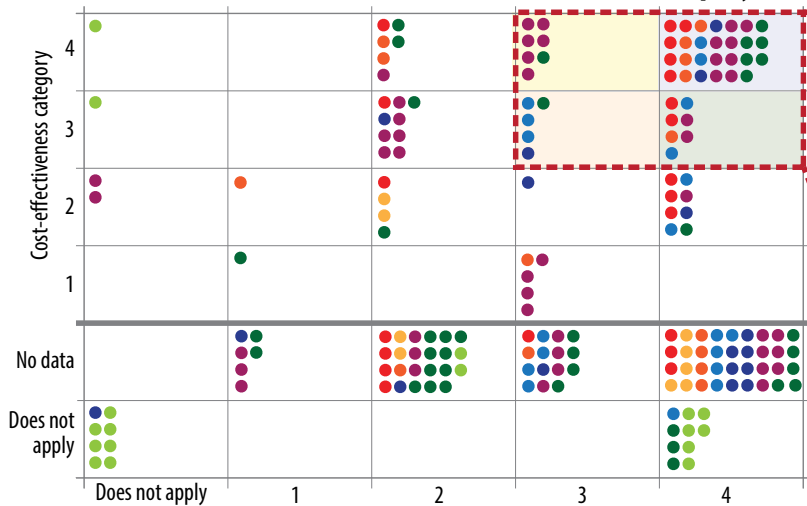
Fortuna Messaye
Ethiopia
14 years old
Leukemia

"My illness started when I was 10 years old. I couldn't learn; each time I sat down, I would fall asleep. At Black Lion Hospital, they took a bone marrow biopsy. Then they told me it was cancer."

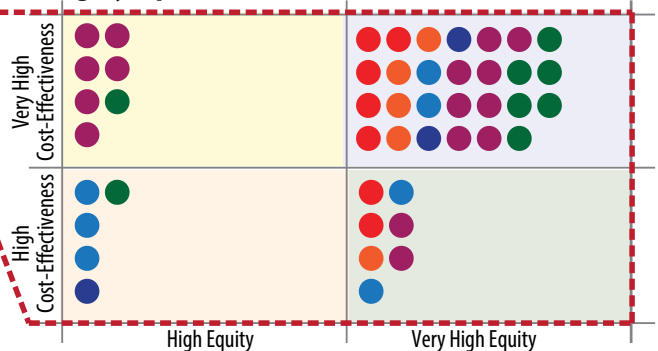
"My grandmother came and started to take care of me. Her kids — uncles and cousins that I have — started to say 'What's the point of helping her since she will not live?'"

"The reason I want to be a doctor is to take care of people in my community and all others, to help them heal. Those who are sick have to know they can be cured. And they have to teach others that it's possible. That's what I think."

All Interventions Scored for Cost-Effectiveness and Equity



Highly equitable and cost-effective interventions



- Cause groups**
- Cardiovascular disease
 - Diabetes, urogenital, blood, and endocrine disorders
 - Neoplasms
 - Chronic respiratory disorders
 - Other and unspecified NCDs
 - Mental, neurological, and substance abuse disorders
 - Injuries
 - Cross-cutting services (rehabilitation, palliative care)



Gracia Vanel
Haiti
23 years old
Sickle cell disease

"I was eight years old. I walked like a normal kid. I had a lot of energy. Then I started feeling pain all over my body and inside my bones. My parents brought me to the hospital. Doctors did a range of tests and determined that I had sickle cell anemia. After that I started to feel sick again. I went back to the hospital, where I stayed for four years.

"It hurts me that I am not able to be more active. I was getting ready to graduate from high school. It's painful to see my classmates graduating while I am not able to do much. I can move around the house. But if I want to leave the house or use the bathroom, I need to find someone to help me. Get up, eat, go outside, sit outside by myself – I don't do much.

"I still have hope that one day I can get up and walk again if I receive good care. There could be another medication that comes out one day that I can be treated with that will help me walk again. I had a dream to learn something that would be useful for society and my family – to see if I could help them too. I haven't lost hope, as long as I have care. I hope to go back to school one day and realize my dreams."

Lead with Equity

by prioritizing equitable, cost-effective interventions that reduce avoidable death and suffering among poor children and young adults

The Lancet NCDI Poverty Commission estimates that progressive implementation of affordable, cost-effective, and equitable NCDI interventions could save the lives of more than 4.6 million of the poorest people between 2020 and 2030, including 1.3 million children and young adults who would otherwise die before the age of 40.

But the poorest countries will require financial assistance to initiate these services. And all LLMICs will need to improve human resources, infrastructure, supply chains, and information systems to implement them at scale with quality.

Lessons from successful campaigns to reduce mortality from infectious diseases and maternal and child health conditions suggest a strategy that addresses both the financing and capacity-building challenges – start with interventions for severe conditions that cause avoidable death and suffering among children and young adults, and leverage them strategically to strengthen the health system overall.

Since 2016, NCDI Poverty Commissions in 15 LLMICs in sub-Saharan Africa, South Asia and the Caribbean, plus one Indian state, have conducted an evidence-based, locally-driven process to prioritize NCDI conditions and interventions. In keeping with the guidance of WHO's Consultative Group on Equity and Universal Health Coverage, they applied a framework that takes account of both equity and cost effectiveness.

The conditions and interventions prioritized

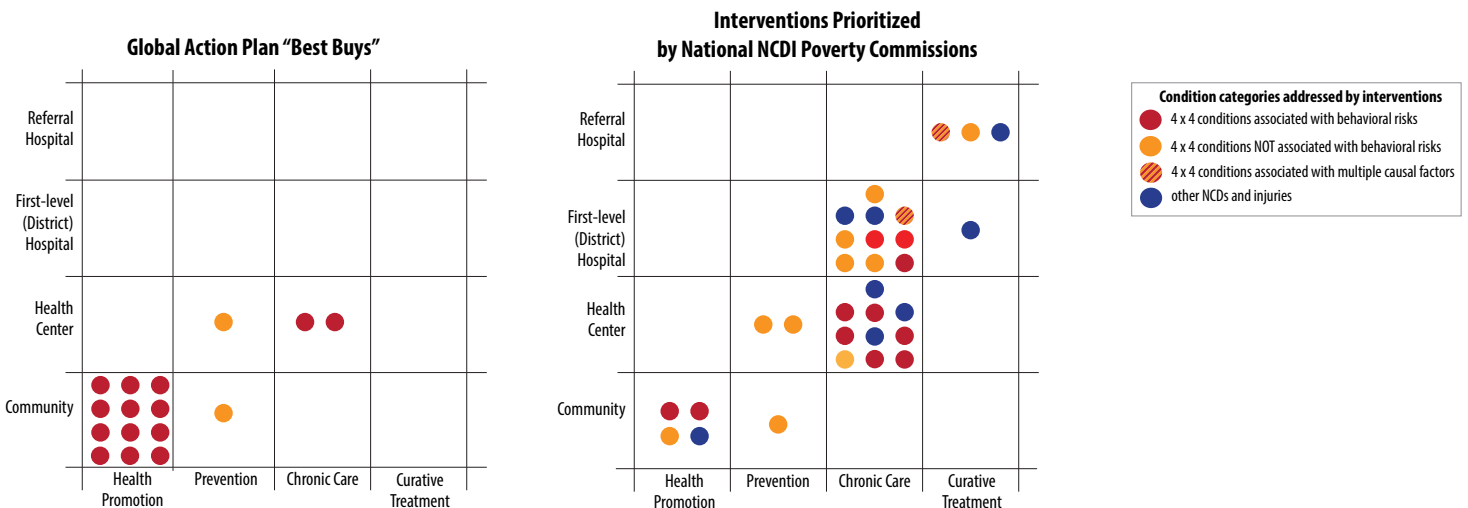
by the Commissions are distinct from, and complementary to, the WHO PEN package and GAP Best Buys. (See figure.)

Commissions that completed the priority-setting process selected an average of 25 NCDI conditions and 35 health-sector interventions based on cost-effectiveness, financial risk protection, and equity-enhancing rankings.

Three-quarters of the interventions prioritized by all of the national commissions address conditions not associated with the behavioral and metabolic risk factors targeted by the Best Buys, including asthma, sickle cell disease, rheumatic and congenital heart disease, type 1 diabetes, non-Hodgkin lymphoma, major depressive disorder, and epilepsy. Similarly, 75% of these prioritized interventions provide chronic care or curative treatment – including surgical services, palliative care, and rehabilitation services – as opposed to health promotion or prevention. And almost half of the prioritized interventions (45%) are optimally delivered at district or referral hospitals, rather than at health centers or in the community. (See figure below.)

The next challenge, as defined by *The Lancet* Commission on high-quality health systems in the SDG era, is to "right place" these prioritized interventions – organizing services at the right level of the health system and by the right providers, so that they can be delivered at high levels of quality.

Global Action Plan "Best Buys" and Interventions Prioritized by National NCDI Poverty Commissions – Complementary Agendas



Decentralize Progressively

to bring prioritized services within reach of the highest-risk individuals and fill gaps in trained staffing, supply chains, and referral pathways

More than 70% of the most equitable and cost-effective interventions for communicable and maternal and child health conditions in LLMICs use highly standardized protocols for highly prevalent conditions that can be delivered at health centers and through community platforms. But that is not the case with NCDIs.

Interventions addressing the most prevalent NCDI conditions that can be delivered in the community and at health centers represent only 18% of the 33 interventions that rank most highly in both equity and cost-effectiveness. (See figure.)

WHO PEN provides a platform to deliver interventions for some of the most common NCDs at the health center and community level. As discussed above, however, a majority of both health centers and first-level hospitals in many LLMICs lack the medicines, equipment, and trained staff to deliver the WHO PEN package.

More than 80% of the most equitable NCDI interventions in LLMICs are delivered at hospitals, including 67% that could optimally be provided

at first-level hospitals but are generally available only at referral and specialty facilities. These interventions are less standardized and require specialized equipment, medicines, and trained staff.

Progressive decentralization is a strategy for increasing availability of services in more remote areas and at lower levels of the health system in a stepwise fashion. In LLMICs that face a gap in availability and quality of services for both severe and common NCDIs, the first step will be to lead with equity by establishing services for severe NCDIs at first-level hospitals.

This stepwise approach to decentralization offers an opportunity to accelerate progress in reducing premature mortality by reaching the highest-risk individuals first. More than 30% of patients with heart failure that could be treated at a first-level hospital, for example, are likely to die within a year if left untreated. For patients with high cardiovascular risk that can be treated at the community and health center level, on the other hand, the annual risk of death without treatment is less than 3%.

In many systems an initial goal of 100% coverage at district hospital level of a complex chronic care service package is achievable within a decade or less, with the potential to prevent thousands of premature deaths each year.

Furthermore, establishing quality services for severe NCDIs at first-level hospitals will bridge gaps in supervision and mentorship, supply chains, and referral pathways for NCDIs. Hospital staff with specialized NCD training can provide mentorship and supervision for staff who deliver WHO PEN services at health centers. Implementation of chronic care services for severe NCDIs at district hospitals will also entail inclusion on “must have” lists for procurement and distribution of essential medicines and supplies for diagnosis and treatment of NCDs at primary and secondary levels of the health system and in rural areas.

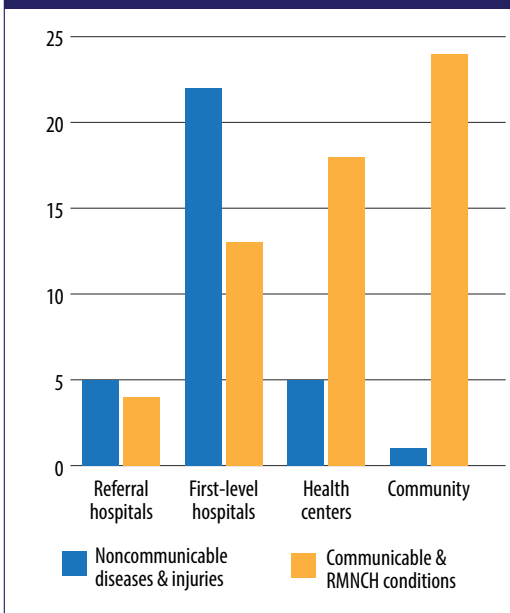


Dipesh Rai
Nepal
17 years old
Rheumatic heart disease

“The doctor said my valve is damaged and it needed an operation. But I came back home without doing the operation, because we didn’t have any money to pay for it. So we didn’t operate, and later as time went by, it became more difficult to breathe. Now two of my valves are damaged, one of which is more severe. It needs to be replaced.”

“I think of my parents a lot. I want to educate myself so I can take care of them. They are very humble. They always agree to what other people say. I want to study Japanese so I can go to Japan to study and work. I will go to Japan, make money, and clear the loans. That’s my plan.”

Number of most equitable and cost-effective interventions by level of the health system – NCDIs vs communicable and RMNCH conditions





Pabitra Manandhar
Nepal
26 years old
Chronic kidney disease

“Life used to be good. I had a very beautiful family. I was pursuing my higher secondary education. Suddenly my head started to hurt. I was unable to do the regular chores and missed a lot of working days. So I decided to go to the clinic. They told me my blood pressure was too high for someone my age. They suspected some issues with my kidney and sent me to a bigger hospital. The doctors told me that my condition wasn’t good.

“I had to pay 2,500 rupees (US\$25) for every dialysis. Neither I nor my family had enough money to pay for it. It was a very difficult time. I had no money for dialysis. I felt hopeless. My dad offered to sell the land he owned. We all agreed as my life was more valuable than a piece of land.

“We are bankrupt. The earthquake destroyed our house and we are living in this makeshift shelter. If only I had a piece of land, I could sell it for the treatment, build a house, and give my parents a good life.”

Integrate Services

based on shared workflow patterns, competencies, and infrastructure as a way to optimize efficiency and quality while increasing access

Efforts to decentralize NCDI services must contend with the challenge of effectively delivering many different interventions to address the “long tail” of NCDI conditions that cause a crushing burden of disease collectively but are not highly prevalent individually.

The *Lancet* NCDI Poverty Commission proposed a strategy to right-place priority interventions by building integrated care teams (ICTs) of mid-level providers, auxiliaries, and physicians to deliver packages of interventions that require related skills and benefit from shared space and information systems. These teams can then provide quality care for multiple conditions in the “long tail” of NCDIs. Highly standardized care for more common conditions can be provided at health centers, and more complex treatment for severe NCDIs can be referred to teams at first-level and referral hospital facilities. (See figure below.)

ICTs are established by identifying gaps in service delivery, defining what competencies, training, equipment, and infrastructure are required to address them, and then assessing what other interventions have similar requirements.

Development of ICTs is guided by three core principles:

- Leveraging inefficiencies in existing space and staffing to minimize the incremental

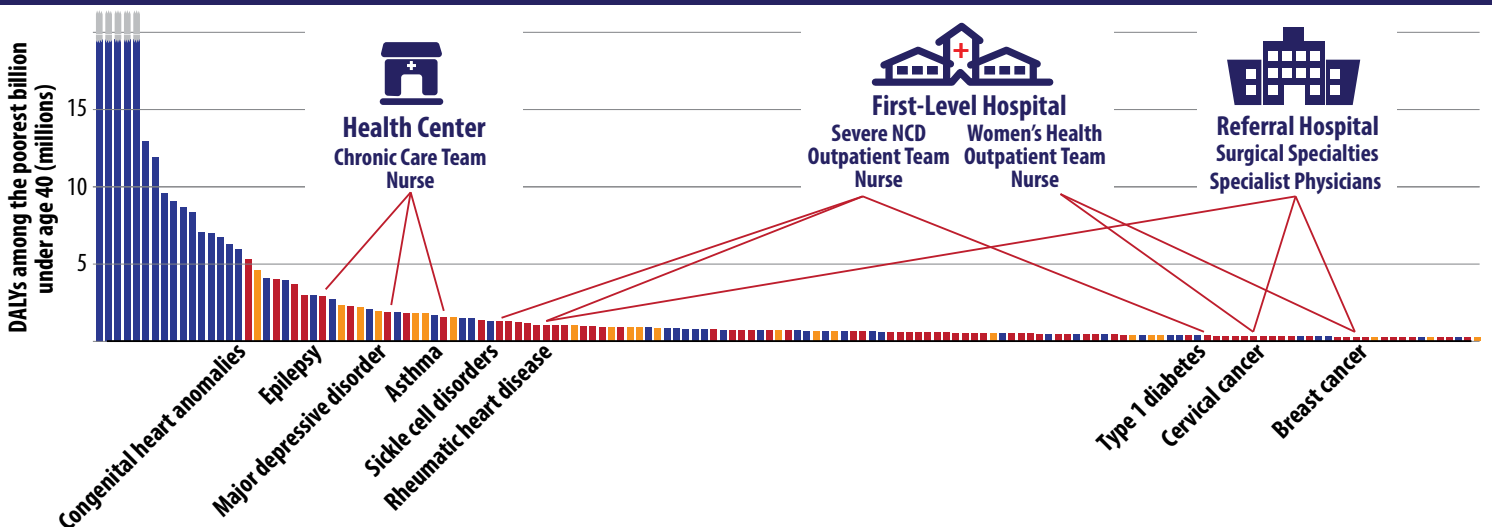
costs associated with improving and expanding service delivery;

- Right-placing services to provide quality care, establish mentorship, strengthen referral pathways, and introduce supervision structures, while increasing access; and
- Optimizing the level of specialization through clustering of related tasks.

ICTs offer a process to optimize human resources. They provide opportunities to introduce new training pathways for generalist physicians or non-physician mid-level providers (task-sharing). They allow introduction of services at lower levels of the health system than would otherwise be possible. And importantly, they define a cohesive set of skills and activities that constitute full-time jobs for providers, allowing them to use and develop their specialized skills, avoid being diverted to other responsibilities, and reduce job dissatisfaction and turnover.

As a way to generate ideas and demonstrate the potential for ICTs, *The Lancet* NCDI Poverty Commission mapped all 280 UHC interventions onto 25 prototype ICTs, and estimated staffing requirements and costs for all of them. Under optimal conditions, 16 of these ICTs would be located at lower levels of the health system, with 10 at first-level hospitals, 3 at health centers, and 3 in the community. (See figure, page 9.)

Some examples of packaging integrated services to address the “Long Tail” of NCDs



Chronic care for severe NCDs at first-level hospitals – a fulcrum for integrated care delivery

Modeling of the prototype ICTs and estimates of their resource requirements were informed by experience with establishing, evaluating, and scaling up the PEN-Plus clinic model first developed in Rwanda to address a gap in chronic care services for severe NCDs that cause death in children and young adults if left untreated, such as type 1 diabetes, rheumatic heart disease, sickle cell disease, and severe asthma. (See box, page 8).

A retrospective costing analysis published in 2019 found that one-time, start-up costs for establishing a typical clinic serving a catchment area of 300,000 people amounted to US\$0.16 per capita, and annual operating costs were \$0.23 per capita, with labor and medications as the main drivers of cost. (See table, page 8).

Cost components included in the PEN-Plus costing analysis indicate the range of investments and resources that must be accounted for in redesigning service delivery and implementing

integrated care teams, including:

- developing a cadre of trained and dedicated staff to provide clinical care, supervision and mentorship, monitoring and evaluation, psychosocial support, and pharmacy and laboratory services;
- establishing and managing supply chains for essential medications and supplies;
- implementing a robust Monitoring and Evaluation system to collect, aggregate, and analyze data; guide program design and implementation; monitor impact; and inform policy and budget decisions; and
- social support, including food packages or cash transfers for T1D patients who cannot manage their insulin without access to food.

With these resources, PEN-Plus clinics can serve as a fulcrum for decentralized and integrated delivery of services for severe NCDs, filling a critical gap in chronic care services and also in pathways for referrals, training and mentorship. (See figure below.)



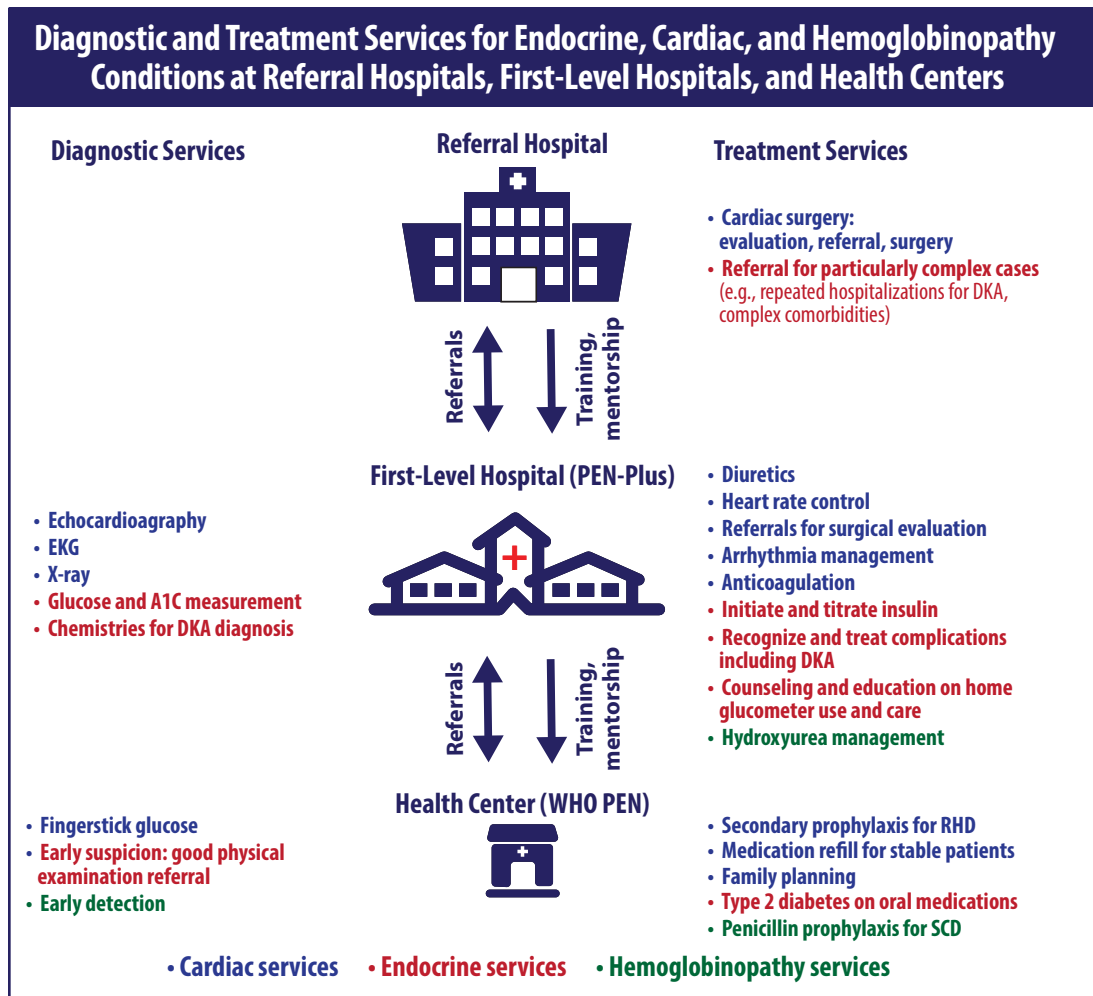
Angelique Mukakarisa
Rwanda
28 years old
Type 1 diabetes

“That night I suffered the worst hyperglycemia. I started saying crazy things and passed out. My parents were terrified.”

“On August 10, 2010, I was taken to Kirehe Hospital. I was in a coma for five days. I arrived on a Tuesday and woke up the following Sunday. The hospital kept looking after me. A doctor told me I could learn to inject myself and take my medicine at school.”

“Our community has a hard time paying for health care because families do not have the means to support it.”

“I am like an ambassador for 16 children with diabetes. I go to Kinamba to pick up medicines for everyone. I bring the medicines to the hospital and they keep them in a refrigerator for us and distribute them to each child when they come for an appointment.”



PEN-Plus – Integrated chronic care for severe NCDs

The Rwanda Ministry of Health, with support from the NGO Inshuti Mu Buzima (Partners In Health-Rwanda), implemented an integrated chronic NCD clinic model at two rural district hospitals in 2006, and added a clinic at a third hospital in 2010. The clinics addressed a gap in care for patients with severe NCDs such as heart failure, rheumatic heart disease, type 1 diabetes, and malignancies.

The clinics have been organized to optimize infrastructure and human resources by clustering conditions and interventions that take advantage of shared space, training, workflow patterns, and competencies (such as managing medications with narrow therapeutic windows such as insulin, heart failure medications and anticoagulants, and morphine for palliative care).

Each clinic is staffed by two to three advanced nurses who see 10-20 patients per day. Physicians supervise initial consultations and consult on complex cases. Specialists visit the clinics ever 1-2 months to confirm diagnoses and consult on complex cases.

The three district-level clinics provided critical

implementation lessons and became practical training facilities for a 3-month course that was established to prepare advanced NCD nurses nationally.

By 2016, the Rwanda MOH had scaled this integrated clinic for chronic care of severe NCDs to all 42 district hospitals in the country and progressively decentralized services for more common NCDs, such as hypertension, type 2 diabetes, and asthma to the health center and community levels.

Experience with the integrated chronic care clinic in Rwanda, and in three other countries that have successfully initiated implementation at selected sites, shows how integrated care teams (ICTs) can leverage inefficiencies in space and staffing by clustering and integrating related services. It also illustrates how ICTs at different levels of the health system interact with and support each other to make a full range of services for prioritized conditions accessible to poor populations.

In 2019, WHO AFRO held a technical consultation in Kigali that recognized the Rwandan model as the basis for a Package of Essential Noncommunicable Disease Interventions for District Hospitals (PEN-Plus).

PEN-Plus Integrated NCD Clinic Start-Up and Operating Costs*

| Cost category | Cost (US\$) | Share of total cost (%) |
|--|---------------|-------------------------|
| Start-Up Costs | | |
| Construction of NCD clinic | 12,633 | 26% |
| Baseline NCD training (training cost per nurse, transportation, accommodations etc.) | 10,824 | 23% |
| Clinic equipment and supplies (BP cuff, peak flow meter, glucometer, ultrasound equipment, INR machine, HbA1c POC machine, office equipment & supplies) | 24,519 | 51% |
| Total start-up costs | 47,976 | 100% |
| Operating Costs | | |
| Labor 2 nurses (50% effort), physician (30%), social worker (30%), pharmacist (20%), lab technician (20%), additional support staff (8 positions @ ≤ 8%), supervising consultants (5%) | 36,980 | 54% |
| Medications | 11,420 | 17% |
| Facility & maintenance | 8,528 | 12% |
| Social services (transportation, food packages) | 5,786 | 8% |
| Laboratory testing | 4,497 | 6% |
| Miscellaneous consumables | 1,316 | 2% |
| NCD refresher training (two nurses) | 448 | 1% |
| Total annual operating costs | 68,975 | 100% |

* Costs for start-up and operation of a PEN-Plus clinic providing integrated chronic care services for severe NCDs at a district hospital with a catchment area of roughly 300,000 people. In the year of the study, the clinic had 632 enrolled patients.

PEN-Plus Clinics in an Integrated NCD Chronic Care Services Model

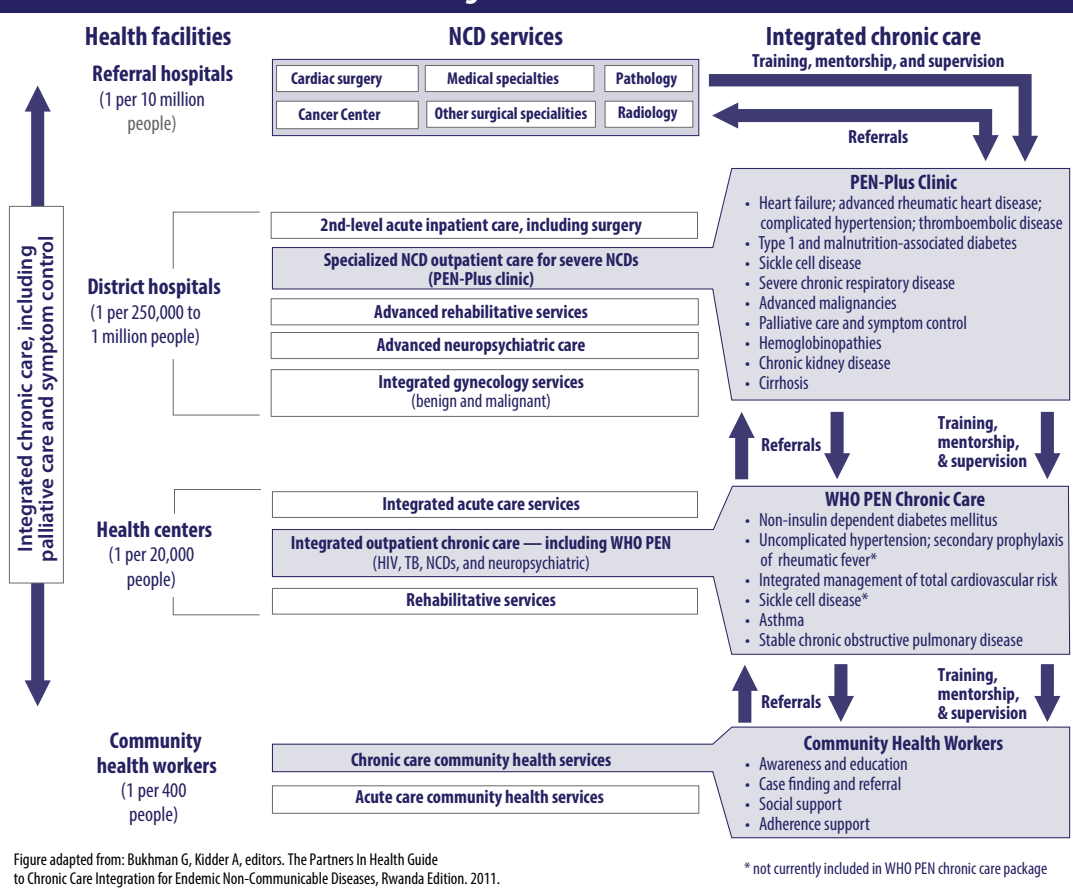


Figure adapted from: Bukhman G, Kidder A, editors. The Partners In Health Guide to Chronic Care Integration for Endemic Non-Communicable Diseases, Rwanda Edition. 2011.

* not currently included in WHO PEN chronic care package

Redesigning care to protect the vulnerable

PEN-Plus clinics illustrate how ICTs established to provide highly cost-effective and equitable interventions for prioritized conditions can serve as the essential building blocks for a diagonal strengthening of the health system that improves access to quality interventions for other conditions. The training and equipment mid-level PEN-Plus providers need to manage medications with narrow therapeutic windows for type-1 diabetes and RHD also enable them to provide quality care for conditions that are generally less severe or affect older adults, such as severe hypertension, atrial fibrillation, rheumatic arthritis, and chronic myeloid leukemia. Similarly, chronic care teams at health centers provide standardized care and adherence and psychosocial support for patients with mild to moderate hypertension, type 2 diabetes, epilepsy, and infectious diseases such as HIV and tuberculosis.

Other ICTs at first-level hospitals can fulfill a similar role in bridging the gap in care between referral facilities in remote capital cities and

health centers in poor, rural areas. (See figure below.)

In addition to treating PEN-Plus patients referred with acute heart failure or diabetic ketoacidosis, for example, an Emergency/High Dependency Team could treat patients suffering from maternal sepsis, trauma, poisoning, and a wide range of other NCDs, including acute coronary syndromes, strokes, prolonged seizures, and ventilatory failure from asthma and COPD. Similarly, an advanced women’s health outpatient team could provide long-term contraception in addition to early detection of breast cancer and opportunistic screening, early detection and treatment of precancerous lesions, and biopsy and referral of stage 1 and 2 cervical cancer.

All of these ICTs at first-level hospitals can serve both to bring treatment previously available only at referral hospitals to rural areas and to provide training and mentorship for ICTs at health centers so that they can manage care for stable patients and recognize when patients need to be referred to higher-level ICTs for evaluation and treatment.



Tigist Gebeyas
Ethiopia
20 years old
Epilepsy

“My illness used to be bad. I would fall every few minutes. Then it started to get better [with medication]. But I can be talking with you, and if I get upset or angry, I will fall.

“My illness makes my family life a bit tough and in particular life with my neighbors. ‘You idiot,’ they say. To my fellow epileptics, I can understand their situation in a way that others can’t. I want to advise their families, ‘Don’t hit them, don’t insult them. They need nurturing and love.’ If they gave that, it would help the disease get better.”

Progressive Decentralization and Integrated Care Teams – Interventions and Estimated Costs



First-Level Hospital

| Interventions NCDI | Other | Cost per capita | % cost for NCDIs |
|--------------------|-------|-----------------|------------------|
| 4 | 6 | \$6.20 | 20% |
| 1 | 2 | | |
| 15 | 2 | \$6.40 | 93% |
| 19 | 4 | \$5.60 | 85% |
| 2 | 0 | \$0.50 | 100% |

- Adult Inpatient Care Team
- Complex ID Outpatient Team
- Emergency/High Dependency Team
- General Surgical Team
- Newborn Screening Team

- Ophthalmic Outpatient Care Team
- Rehabilitation Service Team
- Severe Mental Health Outpatient Team
- Severe NCD Outpatient Team
- Women’s Health Outpatient Team

| Interventions NCDI | Other | Cost per capita | % cost for NCDIs |
|--------------------|-------|-----------------|------------------|
| 2 | 0 | \$0.70 | 95% |
| 5 | 2 | \$1.90 | 100% |
| 2 | 0 | \$2.40 | 100% |
| 13 | 1 | \$3.60 | 100% |
| 4 | 1 | \$0.30 | 100% |



Health Center

| Interventions NCDI | Other | Cost per capita | % cost for NCDIs |
|--------------------|-------|-----------------|------------------|
| 12 | 25 | \$2.90 | 20% |
| 25 | 8 | \$34.40 | 77% |

- Acute/Women’s Care Team
- Chronic Care Team

- Dental Team

| Interventions NCDI | Other | Cost per capita | % cost for NCDIs |
|--------------------|-------|-----------------|------------------|
| 3 | 0 | \$0.30 | 100% |



Community

| Interventions NCDI | Other | Cost per capita | % cost for NCDIs |
|--------------------|-------|-----------------|------------------|
| 6 | 30 | \$1.40 | 9% |
| 12 | 8 | \$2.00 | 70% |

- Acute Care & Prevention Team
- Chronic Care Team

- School-Based Care Team

| Interventions NCDI | Other | Cost per capita | % cost for NCDIs |
|--------------------|-------|-----------------|------------------|
| 6 | 0 | \$1.60 | 92% |



Enock Phiri
Malawi
28 years old
Psychosis

"From time to time I would have an attack. Fear would just strike me, and I would take off running very fast. At that time, everyone was afraid of me. People would mock me shouting, "Crazy man! Crazy man!" People would beat me. Some threw rocks at me. Others tied me up, saying I should be killed..."

"I never knew that a mentally ill person could get well. Because I have seen my friends who didn't go to the hospital and sought help from traditional healers instead. Even now, they are still disturbed. Their illness hasn't left them. But after I ran to the hospital, I got well. I feel fine and healthy and energetic in a good way. I take my medicine at the proper time, and yeah, that's the way."

"People are nice to me now. They bring their clothes for me to sew sometimes. Kids can get close to me now. In the past, they would shout, 'Enock is coming!' and all the kids would hide indoors. Now, my relationship with the community is great. Now, they call, 'Mr. Phiri, Mr. Phiri.' Yeah, I am a happy person. I can feel free, yeah."

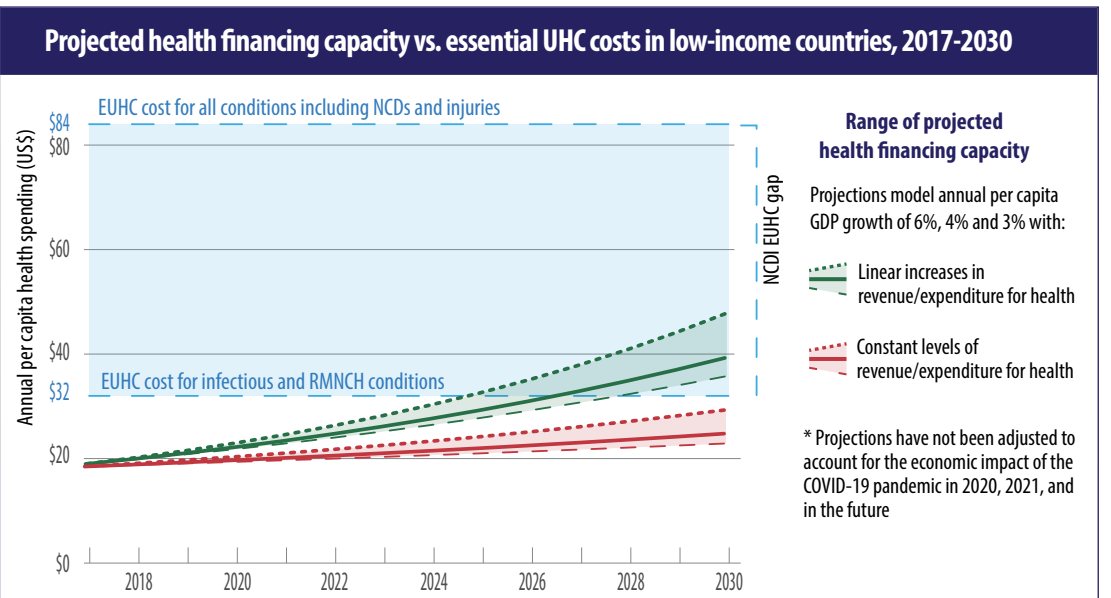
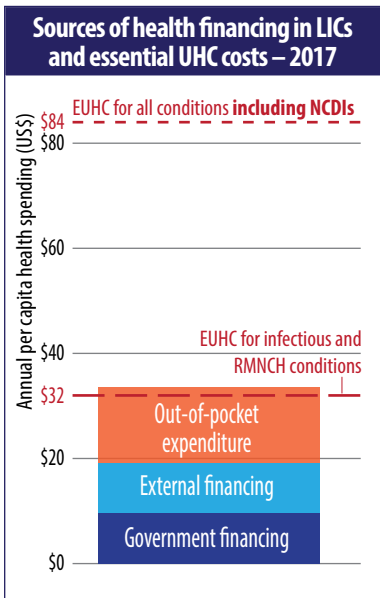
Progressive decentralization and integration – a framework for sustainable health system strengthening, an opportunity for impactful global solidarity

Decentralizing care progressively through integrated care teams provides a cost-effective, sustainable way to improve both quality and access to services at lower levels of the health system. Leading with equity – by starting with ICTs at first-level hospitals that address severe NCDs affecting children and young adults – can yield dramatic reductions in mortality in the near term while a fulcrum to strengthen of services to prevent and manage less severe conditions at health centers and in the community.

A recent study published in *Lancet Global Health* found that scaling up an integrated package of secondary prevention, heart failure management, and cardiac surgery for rheumatic heart disease – anchored in PEN-Plus clinics at first-level hospitals – could avert around 70,000 deaths in the African Union by 2030, with a return on investment of 4.7:1. More broadly, the *Lancet NCDI Poverty Commission* found that scaling up 141 EUHC health-sector interventions for NCDs to 98% coverage between 2020 and 2030 would not only enable countries to reach the SDG target of reducing NCD mortality between the ages of 30 and 70 by a third. It would also save the lives of 925,000 children and young adults among the world's poorest billion who would otherwise have died before reaching the age of 40.

In the near term, most low-income countries will not be able to finance the investments required to achieve this level of coverage from domestic resources. Even with optimistic assumptions about increases in revenues and health expenditures resulting from economic growth, the *Lancet NCDI Poverty Commission* found that LICs might reach the \$32 per capita required to provide EUHC for infectious diseases and maternal and child health conditions by 2030, but would fall far short of the \$84 per capita EUHC cost for all conditions including NCDs. (See figure below.) And that was before the COVID-19 pandemic triggered a steep global recession and flattened projections for economic growth.

UNDP has estimated that in a "high damage" scenario, the pandemic could push more than 250 million additional people into extreme poverty by 2030. But the study also finds that a tight focus on the SDGs, including a targeted doubling of the public health budget, could not only prevent the rise of extreme poverty, but actually accelerate the development trajectory the world was on before the pandemic. Investing in progressive decentralization and integration of NCDI services represents an opportunity for both national governments and international funders to advance that "SDG Push" scenario.



The Way Forward –

a country-driven process to assess the NCDI burden, prioritize interventions, develop and implement models for integrated service delivery, and scale them up nationally

Through national NCDI Poverty Commissions and the [NCDI Poverty Network](#) launched in December 2020, 23 low- and lower-middle-income countries have engaged in a four-phase process leading to development and implementation of integrated delivery models.

Phase 1 involves situation analysis and priority-setting to assess NCDI burden and prioritize interventions, based on principles of equity and cost-effectiveness, and recommend policies to **Phase 2 involves design of integrated delivery models** for prioritized interventions informed by facility assessment, task mapping, and the analytical tools and framework of an emerging “integration science”.

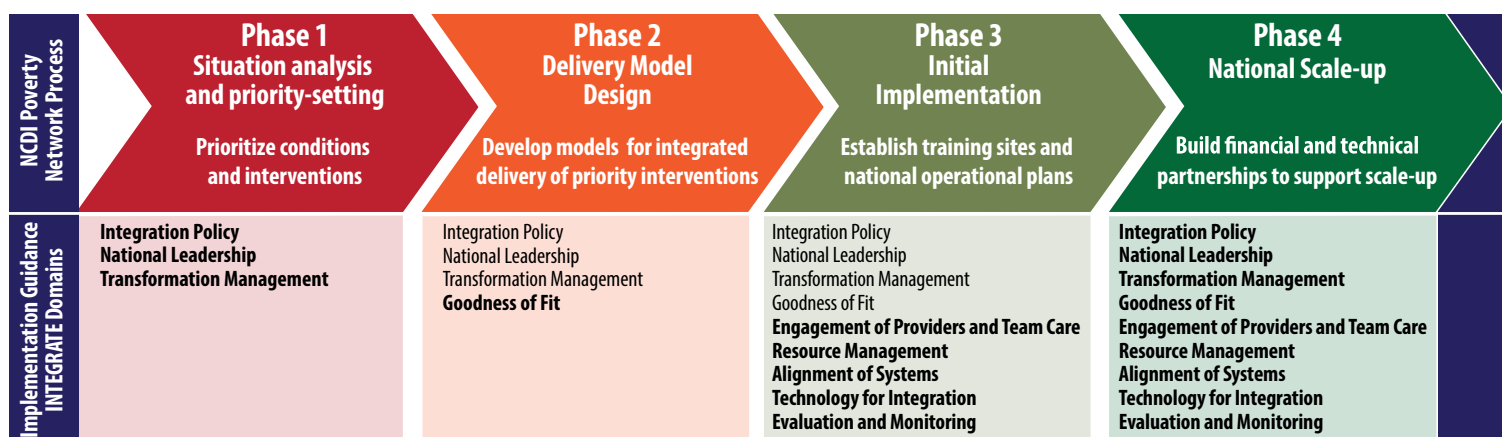
Phase 3 involves initial delivery model implementation,

training site development, and operational planning for scale-up.

Phase 4 involves building financial and technical partnerships to support scale-up and sustainable implementation of integrated delivery model(s) at national scale.

This process – implemented through either a national NCDI Poverty Commission or existing national NCD coordination bodies – addresses all nine of the NCD INTEGRATE domains provides a **proven framework for leading with equity, decentralizing progressively, and integrating service delivery.**

It also addresses all nine of the NCD INTEGRATE domains mapped out in WHO’s Implementation Guidance to INTEGRATE NCDs. (See figure below.)



Acknowledgements & References

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The brief is intended primarily for policy makers, program managers, and health providers. A secondary audience includes WHO and international technical and funding partners who can support countries in developing and implementing integrated service delivery models.

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Malawi – A Case Study in Progressive Decentralization and Integration of NCDI Services

3 Keys to Bridging the Gap in Delivery of NCDI Services

Lead with Equity

by prioritizing equitable, cost-effective interventions that reduce avoidable death and suffering among poor children and young adults

Decentralize Progressively

to bring prioritized services within reach of the highest-risk individuals and fill gaps in trained staffing, supply chains, and referral pathways

Integrate Services

based on shared workflow patterns, competencies, and infrastructure, as a way to optimize efficiency and quality while increasing access



At the PEN-Plus clinic in Lisungwi, Malawi, Kerefasi Wiliyamu, a 14-year-old living with type 1 diabetes, is examined by clinical officer Kenwood Kumwenda, while his mother, Sofiya Simoni, speaks with clinical officer Medson Boti.

Photo: Karin Schermbrucker/Slingshot Media for PIH

In 2012, Malawi took its first step toward decentralizing integrated NCD services to rural areas by piloting an adapted WHO PEN package in a single district. Three years later, in 2015, with support from the World Diabetes Foundation (WDF), the Malawi MOH began rolling out primary care for patients with hypertension and diabetes at hospitals in 16 districts in the northern and central regions.

That same year, the Malawi MOH, in partnership with the international NGO Partners In Health (PIH), launched an integrated HIV-NCD clinic at two district hospitals and 12 health centers in rural Neno District in the southern region.

The Malawi NCDI Poverty Commission published its report in 2018. The Commission found that less than 10% of hospitals and health centers in rural areas were fully equipped to treat common NCDs, and coverage for more severe NCDs was even lower. The Commission called for NCDI services to be expanded to focus on rural health facilities, the most vulnerable Malawians, and a set of 38 prioritized conditions, including RHD, T1D, and several other severe conditions.

The MOH and PIH opened Malawi's first two PEN-

Plus clinics in early 2018 at Neno District Hospital and Lisungwi Community Hospital. These clinics – staffed by clinical officers, nurses, and clerks who had received specialized training in chronic care for severe NCDs – rapidly enrolled patients with complex NCDs who had previously been seen in the integrated HIV-NCD clinic.

In 2019, following publication of the Commission report and the launch of PEN-Plus, the MOH team changed tactics for a WDF-funded project in the southern region to pursue a progressive decentralization strategy. This strategy focused on establishing NCD services at first-level hospitals across the south, laying the foundation for PEN-Plus implementation through clinics that functionally operate as a hybrid between WHO PEN and PEN-Plus.

Also in 2019, the MOH presented on Malawi's progress toward implementing PEN-Plus at WHO AFRO's Regional Consultation on WHO PEN and PEN-Plus and established a Stakeholder Group to develop an operational plan for scaling up PEN-Plus nationally.

The operational plan, finalized early in 2021, maps out plans to expand PEN-Plus services progressively to reach an additional 54 first-level hospitals and 17,346 patients with severe chronic NCDs.

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