The Union

International Union Against Tuberculosis and Lung Disease

FINAL REPORT

Enhancing Access to Inhaled Medicines

Lessons from Insulin Access

September 2026

Developed in collaboration with

Alstonia Impact



The Union

International Union Against Tuberculosis and Lung Disease

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EXECUTIVE SUMMARY

Executive Summary (1/9): Diabetes (insulin) is ahead of the curve within NCDs in LMICs, and can offer key lessons for asthma and COPD (inhaled medicines)

- The **objective of this work is to translate insulin access lessons to inhaled medicines for asthma and COPD and create recommendations for the broader field.** Both insulin and inhaled medicines are life-saving medicines for Non-Communicable Diseases (NCDs) which rely on drug-device combinations
- The work **focuses on inhaled medicines with limited access** (long-term controller/management therapies including Inhaled corticosteroids (ICS) and long-acting bronchodilators, which come in 2 types, long-acting beta-agonist (LABA) and long-acting muscarinic antagonists (LAMA), plus their combinations) in LMICs; we consider a **global view** but also deep-dive into **four countries** with distinct health systems: Kenya, Kyrgyzstan, Peru, and Tanzania
- Over 240 documents were reviewed, and 15 global and country experts on diabetes (insulin), and Asthma and COPD (inhaled medicines) were interviewed for this work
- Diabetes imposes a large burden on LMICs; **Insulin, a biological product, is required for all Type 1 Diabetes (T1D) patients and for a significant proportion of Type 2 Diabetes (T2D) patients as a second-line treatment**. Currently, **most insulin used in LMICs is human insulin delivered in vials** and administered via injections in contrast with HICs where a pen/devices with pre-filled analogue insulin are standard. **WHO currently endorses human insulin in vials** as the costs are lower compared to analogue insulin in pens and the clinical benefits are not significantly different
- Along with hypertension, **diabetes is one of the first non-communicable diseases (NCDs) that have seen significant attention from LMICs governments** and has seen **several successes worth learning from**
  - Countries have **largely addressed hygiene factors for treatment with insulin,** i.e. updated guidelines, inclusion in EMLs, inclusion in reimbursements, registration of products by regulatory authorities
  - Most countries have moved **screening and diagnosis of diabetes to the primary level, ensuring that more people are diagnosed. WHO's PEN guidelines** have been influential in this regard
  - **Three major companies** have significant LMIC presence. They engage in LMICs through **donations (usually for T1D)** and **tiered pricing.** Major companies like Novo Nordisk have capped pricing in many LMICs, e.g. Novo has a pricing of $3 / vial in many LMICs, and $2 / vial in crisis/humanitarian settings



EXECUTIVE SUMMARY

Executive Summary (2/9): Lessons can be drawn both from success and missteps of the insulin experience

- It is important to note that **several challenges still impede access to insulin in LMICs, and this work learns from successes as well as areas of improvement**
- There are **many challenges** that persist for diabetes patients in LMICs
  - Across countries, **financing is nascent and fragile.** There are **challenges in service delivery centralization with high dependence on specialists.** In addition, **for insulin, there are affordability concerns as it may not be fully reimbursed or available in public facilities. Out-of-stock in public systems** is common, which leads to private purchase and high out of pocket spending for patients.
  - A **highly concentrated market with three players dominating LMICs has led to some adverse consequences,** including **lack of reliability of supply and barriers to entry to generics and biosimilars.** Many countries have high dependence on a single supplier. As of mid-2026, **this may be changing as the major pharma companies shift their priorities away from human insulin** and WHO and other **global health players are supporting the entry of LMIC-based quality assured players**
  - Across **four countries analyzed**, similar issues were seen:
    - **Kenya:** Major gaps in financing, limited or delayed diagnosis, and poor treatment adherence due to stock-outs and incorrect beliefs among those diagnosed; **Kyrgyzstan:** Insufficient government budgets; many missed / delayed diagnoses; treatment requires specialists, causing a bottleneck and limiting access to care, and out of pocket spending despite mandate for free insulin; **Peru:** High centralization affects remote populations; low diagnosis rate, limited access to free insulin as supply fails often leading to high out of pocket costs; **Tanzania:** Low diagnostic rates; among those in treatment, limited adherence due to personal beliefs / stigma, poor supply, and resulting high out of pocket spending
- Some **lessons can be learnt from initiatives** to improve access to insulin
  - Most **global/multi-country initiatives are supported by big 3 insulin firms; donation programs (esp. for T1D for children) and voluntary lower pricing have helped.** Unlike other areas such as maternal and child health, and infectious diseases, there are **no major philanthropic donors and engagement of pharma players has partly filled a gap. However, valid questions around sustainability and effects on competition exist.** Lower promised prices by firms do not always translate into real purchase prices due to intermediaries and taxes.
  - **Notable LMIC based country initiatives include centralized procurement (e.g., by Kyrgyzstan) to reduce prices** and **running decentralized fixed day clinics for diabetes** (e.g., Tanzania). **Making insulin free (vs. copay) has also reduced financial burdens on patients, if sufficient supply exists. Procurement and supply chain efforts are necessary to bring products to people who need them,** especially in view of insulin's cold storage requirements (Efforts by ACCISS around supply chain transparency)
  - **Isolated initiatives that address only part of the problem** (e.g., inclusion in EML without significant procurement) have usually failed

EXECUTIVE SUMMARY

Executive Summary (3/9): Asthma/ COPD see much lower attention across the board, including from LMIC governments and the industry

- **Asthma and COPD impose a large burden on LMICs;** access to inhaled corticosteroids and bronchodilators is essential to prevent exacerbations and premature deaths, with the strongest evidence for mortality prevention in asthma. For COPD, long-acting bronchodilators (LABA-LAMA combination), are effective in improving symptoms and quality of life.
- Some **early success in access to inhaled medicines** must be noted
  - Asthma and COPD have been **included in the influential WHO PEN guidelines,** which promote the integration of NCD care into primary health care
  - A **key resolution at the World Health Assembly** (WHA78.5) was passed in 2025 focused on promoting and prioritizing an integrated lung health approach
  - **UN Political Declaration on NCDs** was adopted in 2025 requiring all Member States to achieve 80% access to affordable, WHO-recommended, inhaled medicines in primary-care facilities and for at least 60% of countries to have financial-protection measures that limit the cost of inhaled medicines by 2030
- **Key challenges impeding access to inhaled medicines**
  - Overall, **very low uptake of ICS/LABA with inappropriate overuse of short-acting** relievers**:** in most LMICs, ICS+LABA being available only in small private markets. For Asthma, a new model of care is emerging which involves short acting ICS+LABA in a single inhaler; this plays the role of a reliever and controllers. However, this needs to be endorsed by WHO and others for broader LMIC adoption
  - Globally, **low political prioritization and financing; service delivery poorly organized leading to very low diagnosis rates** (in part due to **impractical diagnostic - spirometry), very low uptake of ICS** and **sub-optimal treatment with stigma as a major challenge**
  - Challenges are **largely similar across the four countries: Kenya:** Systemic underfunding, lack of focus leads to low capabilities, equipment, and medicines esp. at primary level; social stigma compounds challenges; **Kyrgyzstan:** Low govt. attention, high specialist dependence and stigma as cross-cutting challenges; poor availability of ICS inhalers outside capital and high out-of-pocket payments due to high co-payments; **Peru:** Low diagnosis for COPD; shortages of control therapies lead to poor adherence and/or private purchase and high out-of-pocket spending; **Tanzania:** Insufficient funding leads to limited diagnostic equipment and untrained providers; among few diagnosed, adherence poor due to stigma and limited medicines in public facilities
- **Very few initiatives to improve access to inhaled medicines:**
  - **Barring Brazil's case where access to inhaled medicines was made free, most other initiatives were small and not many have succeeded;** some early research efforts are ongoing
  - **Pharma industry has not engaged in the same** way as it has for diabetes and insulin

EXECUTIVE SUMMARY

Executive Summary (4/9): Several key similarities and differences between diabetes (insulin) and, asthma and COPD (inhaled medicines) were noted before making recommendations

- **Key similarities** between diabetes (insulin), and Asthma and COPD (inhaled medicines):
  - **Both insulin and inhaled medicines face challenges due to mode of administration vs. conditions that require oral medicines**
  - **Centralization of prescription, diagnosis and treatment,** with high reliance on specialists
  - **Major availability/affordability challenges for LMIC contexts**
  - **Provider fear of prescribing both insulin and inhaled medicines**
- There are also **notable differences, including those that are favorable to improved access to inhaled medicines and those that are not**
  - **Favorable differences:**
    - **Cold chain is not needed** for most inhaled medicines
    - Products for **HICs and LMICs are largely the same** (for insulin, products used in HICs and LMICs are very different which results in the shift in attention of insulin suppliers to more expensive analogue insulin or new products (e.g., GLP-1), LMICs largely rely on the cheaper human insulin market. Barring the triple therapy and advanced biologics, **treatment options are largely the same in LMICs and HICs for inhaled medicines).**
    - **Relevant generics that sell inhaled medicines in HICs can theoretically leverage their SRA registrations** to enter more LMICs using WHO's Collaborative Registration Procedure (CRP). In case of insulin, there are no SRA registered generics for human insulin, the relevant product in LMICs
    - **Opportunity for economies of scale**: the originator for formoterol / budesonide (AstraZeneca) has significant manufacturing capacity, and they have dry power device that overcomes many of the issues with MDI/CFCs, and they have the capacity to deliver at very low cost (so willingness to do it is a key driver here)
  - **Unfavorable differences:**
    - Much **lower attention** of donors, public health stakeholders, pharma players
    - Much **lower attention and budgets** from LMIC governments
    - **Guidelines that are not always updated, lower knowledge of product use even among health care providers** that leads to **much lower screening and diagnosis rates** (note: the upcoming WHO PEN update would improve this point)
    - Major **diagnostic product (spirometer)** difficult for most people to use and expensive, with limited availability in primary care centers, very low availability in referral centers, and no option for patients to diagnose themselves
    - **Presence of accessible products that offer short-term relief** (SABAs) is **also a deterrent to proper treatment management** which is less of an issue for diabetes
    - **Stigma around conditions, inhaled medicines, and steroids are significantly higher** for asthma and COPD
    - **Lack of patient groups** for effective advocacy

Executive Summary (5/9): Our preliminary recommendations for the field (1/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Drive greater global attention towards and COPD via targeted advocacy	1 **Keep the spotlight on WHA and UN political resolutions and declarations to bring greater attention and resources to problem**	• Support also the ongoing effort towards WHA resolution on Access to NCD Medicines for Children to ensure focus on asthma inhalers • Support the NCD Alliance to take on advocacy campaigns for asthma and COPD, including tracking government commitment to addressing these diseases/conditions • Support The Union, FIRS, ERS, GOLD and GINA to champion the need for more attention to asthma and COPD
	2 **Drive greater attention to field by strategically piggybacking on topics that already have traction**	• UHC movement (high level-UN meeting 2027) • PEN and PEN Plus have momentum • TB -> Lung health integration (lung health unique for NCD and infectious integration) • Environmental/Clean Air agenda and climate change/health
	3 **Support formation and engagement of patient advocacy groups**	• Strong voice of patients is needed, similar to diabetes • Global, regional, and national respiratory societies could support (e.g., as part of FIRS or of the NCD Alliance). Leverage groups like NCD Alliance and MSF in advocacy and community engagement
Update relevant global guidelines to align with latest science	4 **Provide technical assistance to support countries to align their guidelines to the latest versions**	• The GOLD (for COPD >>) and GINA (for asthma >>) reports include the latest international standards used by healthcare providers to diagnose, manage, and treat chronic obstructive lung diseases • The WHO PEN package is the operational vehicle by which most LMIC primary-care systems implement NCD management; it currently does not include the latest guidelines aligned with the latest evidence base, but an updated version should be released in 2026/2027 • Country support to align to latest guidelines, tapping on all relevant sources

SOURCE: In-line with text; Team analysis

EXECUTIVE SUMMARY

Executive Summary (6/9): Our preliminary recommendations for the field (2/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**5 Holistic country implementation work in selected LMICs to prove the case that demand exists and can be served**	• Select a mix of countries where program would be under Primary care[1] MoH dept and others where TB programming is being widened (Global Fund and other resources may be available for these); most importantly, pick countries which are ready, e.g., multiple products already registered • Need to address demand and supply factors together (taking together all relevant stakeholders including suppliers) • Major effort needs to de-stigmatize inhalers and steroid use with populations and with healthcare providers • Prioritize asthma at the primary-care level, where diagnosis and ongoing management can often be delivered using clinical assessment and simple tools such as peak-flow meters. A pathway for referral to secondary care for people who do not improve with first line therapy delivered in primary care should also be clearly defined • Train primary care workers to think of COPD as a cause of cough and breathlessness that should be differentiated from TB and heart failure, and establish pathways for treatment
Provide opportunistic TA support in non-demonstration countries	**6 Provide opportunistic support by piggybacking on other adjacent efforts**	• Opportunistic support could include governance, financing and operational advice for inclusion of Asthma and COPD in ongoing efforts (e.g., lung health integration for TB – push by Global Fund, PEN-Plus expansion) • As part of broader NCD / UHC expansion, ensure that asthma and COPD find a “home” at the highest level of governance at MoH (either within TB expansion -> lung health OR with NCD departments) • Advocate for inclusion in UHC package and budget lines for Asthma and COPD • Support countries to improve diagnoses and prescriptions at least at secondary, tertiary levels (primary is hard work and may happen later once demonstrations present compelling evidence)

1. Even if asthma and COPD are NCDs, most patients show up with respiratory symptoms at primary care / emergency centers, not to NCD clinics

SOURCE: In-line with text; Team analysis

Executive Summary (7/9): Our preliminary recommendations for the field (3/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Address selected supply-side challenges globally	7 **Increase in-country competition by supporting firms esp. generics with WHO's CRP procedure to register in more LMICs**	• Note: many of the generic ICS+LABA products are already registered with some SRAs
	8 **Support LMIC NRAs with capacity building for inhaled medicines**	• There are currently no standard ways of showing that generic inhalers have the same effectiveness as originators
	9 **Negotiate more affordable prices with pharma companies in LMICs**	• Experience from insulin shows direct price negotiations with pharma companies proved more effective than tenders to reduce purchase price • Options to be explored include: tiered pricing, volumes guarantees, long-term agreements (e.g., like Medicines Patent Pool, UNICEF, CHAI), demand consolidation through global or regional platforms (e.g., like the TB Drug Facility, UNICEF, PAHO Strategic Fund)
Develop knowledge products	10 **Develop knowledge products to help better articulate challenges, potentially in collaboration with the WHO**	• State of inhaled medicines market covering key market developments (released at a pre-defined frequency)[1] • End-to-end analysis of access to care for asthma / COPD patients, including access to inhalers, but extending also to diagnostics, referrals, etc.

1. This could include: Status of registration of key medicines in LMIC; Capability landscaping of NRAs for assessing inhaled medicines; ACCISS-style studies around pricing and its determinants, supply chain and availability in LMICs: map the current value chains and introduce systems to increase their transparency (e.g., visibility on transfer prices, on stock levels at different steps of the value chain, on tariffs and taxes, etc.), leading to its streamlining (e.g., removing intermediaries, etc.). A source of inspiration for this can be the annual HIV Market Report produced by CHAI

SOURCE: In-line with text; Team analysis

EXECUTIVE SUMMARY

Executive Summary (8/9): Our preliminary recommendations for the field (4/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Support R&D efforts	11 **Support innovators that try to improve current medications**	• Possible innovations currently explored by innovators include non-steroidal medicines, new delivery methods other than inhalers, etc. • Note: these are unlikely to become available in the short-term
Support broader market shaping	12 **Support the development of pooled procurement efforts**	• Data generation could be the first step in supporting pooled procurement and long-term agreements for lower pricings • Support and actively engage in procurement across health areas including TB (e.g., APPM, TDF, UNICEF, Global Fund) • Develop technical assistance modules to support governments in integration of treatment for asthma and COPD across other disease areas including TB and in primary care clinics • Look for inspiration from other experiences such as Africa CDC, African Pooled Procurement Mechanism (APPM), TB Drug Facility

Note: While limited diagnosis was identified as a major challenge, the focus of this report was access to inhaled medicines, so no specific recommendations about diagnosis were included.

SOURCE: In-line with text; Team analysis

EXECUTIVE SUMMARY

Executive Summary (9/9): Recommendations rated on potential impact along likely timelines (indicative)

	SHORT TERM (within 3 years)	MID TERM (3+ years)
HIGH IMPACT	1 Keep the spotlight on WHA and UN political resolutions and declarations to bring greater attention and resources to problem 4 Provide technical assistance to support countries to align their guidelines to the latest versions 5 Holistic country implementation work in selected LMICs to prove the case that demand exists and can be served 9 Negotiate with pharma companies more affordable prices in LMICs	3 Support formation and engagement of patient advocacy groups 12 Support the development of pooled procurement efforts
MID IMPACT	2 Drive greater attention to field by strategically piggybacking on topics that already have traction 6 Provide opportunistic support by piggybacking on other adjacent efforts	7 Increase in-country competition by supporting firms esp. generics with WHO's CRP procedure to register in more LMICs 8 Support LMIC NRAs with capacity building for inhaled medicines 10 Develop knowledge products to help better articulate challenge, potentially in collaboration with the WHO 11 Support innovators that try to improve current medications

SOURCE: Team analysis

The following people contributed to the preparation of this report

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Dr. Cassandra Kelly-Cirino
The Union, Executive Director



Dr. David Halpin
Global Initiative for Chronic Obstructive Lung Diseases (GOLD), member of the board of directors



Dr. Guy Marks
The Union, President



Leith Greenslade
Every Breath Counts, Coordinator



Marina Giachino
NCD Policy Lab, University of Geneve, Researcher



Alessio Damato
Alstonia Impact, Partner



Dhananjay Vaidyanathan Rohini
Alstonia Impact, Partner



Samyukth Ramkumar
Alstonia Impact, Associate

We acknowledge the contribution of the following individuals who provided us with rich insights (in alphabetical order):

Adyl Temirov (Director, Health Policy Analysis Center, Healthcare Financing Expert, HPAC Kyrgyzstan), **Aida Abdraimova** (Senior Analyst, Health Policy Analysis Center, PHC services and drug supply Expert, HPAC Kyrgyzstan), **Dr. Aizhamal Tabyshova** (Respiratory expert, Kyrgyzstan), **Cécile Macé** (Global expert on access to medicines), **Clarke Bhandari Cole** (Associate Director, Global NCDs, CHAI), **Dr. Cyrus Baidoo** (Senior Program Manager, Global Markets, CHAI), **Dr. David Beran** (NCD Policy Lab, Faculty of Medicine, University of Geneva), **Dr. Eva Njenga** (Director, Kenya Diabetes Management and Information Centre), **Janeth Tenorio** (Lead Researcher, CRONICAS Peru), **Dr. Jeremiah Chakaya Muhwa** (Respiratory expert, Kenya and past President, The Union), **Dr. Kaushik Ramaiya** (Tanzania NCD Alliance), **Dr. Maria Lazo** (Researcher, Project Lead, CRONICAS Peru), **Dr. Maria Sofia Cuba Fuentes** (Respiratory expert, Center for Research in Primary Health Care (CINAPS), Peru), **Dr. Olatubosun Akinola** (Senior Director, Global NCDs, CHAI), **Dr. Rodrigo Cataldi** (WHO), **Dr. Sarah Rylance** (WHO), **Silvana Perez Leon** (Project Manager, CRONICAS Peru), **Dr. Stellah Mpagama** (Respiratory Expert, Tanzania), **Dr. Sundeep Salvi** (Global expert on Asthma and COPD, GINA/GOLD), plus representatives of two global pharma companies

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List of Abbreviations (1/4)

ABBREVIATION	MEANING / EXPANSION
ACCEDE	ACCEDE project (FIND-led diagnostics access project, Kenya)
ACCISS	Addressing the Challenge and Constraints of Insulin Sources and Supply
AIR	(therapy) Anti-Inflammatory Reliever therapy
AIRE	Asthma Implementation Research (randomized trial, Peru)
AMPATH	Academic Model Providing Access to Healthcare
BoP	Base of the Pyramid
CAGR	Compound Annual Growth Rate
CarePak	Diabetes CarePak initiative
CDiC	Changing Diabetes in Children (program)
CENARES	Centro Nacional de Abastecimiento de Recursos Estrategicos (Peru central procurement)
CGM	Continuous Glucose Monitor(ing)
CHAI	Clinton Health Access Initiative
CHF	Congestive Heart Failure

ABBREVIATION	MEANING / EXPANSION
CHW	Community Health Worker (CHP = Community Health Promoter)
CLD	Chronic Lung Disease
COPD	Chronic Obstructive Pulmonary Disease
COVID	Coronavirus Disease (COVID-19)
CRD	Chronic Respiratory Disease
CRP	C-Reactive Protein
CT	Computed Tomography
CUAMM	Doctors with Africa CUAMM (NGO)
DALY	Disability-Adjusted Life Year
DHIS2	District Health Information Software 2
DPI	Dry Powder Inhaler
EML	Essential Medicines List
EMR	Electronic Medical Record

List of Abbreviations (2/4)

ABBREVIATION	MEANING / EXPANSION
EsSalud	Seguro Social de Salud (Peru social health insurance)
FIND	Foundation for Innovative New Diagnostics
FIRS	Forum of International Respiratory Societies
FMC	Family Medicine Centre
FRESH AIR	Free Respiratory Evaluation and Smoke-exposure reduction by primary Health care Integrated groups (Initiative)
FVC	Forced Vital Capacity
GDP	Gross Domestic Product
GECo	Global Excellence in COPD Outcomes (study)
GINA	Global Initiative for Asthma
GLP-1	Glucagon-Like Peptide-1 (receptor agonist)
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GSK	GlaxoSmithKline
HbA1c	Glycated Hemoglobin (blood-glucose control marker)

ABBREVIATION	MEANING / EXPANSION
HCW	Health Care Worker
HIC	High-Income Country
HIV	Human Immunodeficiency Virus
HMIS	Health Management Information System
ICS	Inhaled Corticosteroid
IDF	International Diabetes Federation
IDMPS	International Diabetes Management Practices Study
IMPALA	Improving Management of Lung Health and TB in Africa (Initiative)
IPACT	Improving Primary care of Asthma and COPD Together (initiative)
IU	International Unit
KEMSA	Kenya Medical Supplies Authority
KES / KSH	Kenyan Shilling
KII	Key Informant Interview

List of Abbreviations (3/4)

ABBREVIATION	MEANING / EXPANSION
LABA	Long-Acting Beta-Agonist
LAMA	Long-Acting Muscarinic Antagonist
LFAC	Life for a Child (insulin donation program)
LMIC	Low- and Middle-Income Country
MDI / pMDI	(pressurized) Metered-Dose Inhaler
MECE	Mutually Exclusive and Collectively Exhaustive
MHIF	Mandatory Health Insurance Fund (Kyrgyzstan)
MoH	Ministry of Health
MSD	Medical Stores Department (Tanzania central procurement)
NCD	Non-Communicable Disease
NGO	Non-Governmental Organization
NHIF	National Hospital Insurance Fund (Kenya, predecessor to SHA)
NIHR	National Institute for Health and Care Research (UK)
NPH	Neutral Protamine Hagedorn (intermediate-acting insulin)

ABBREVIATION	MEANING / EXPANSION
NRA	National Regulatory Authority
PATH	Program for Appropriate Technology in Health
PEN	(WHO) Package of Essential Noncommunicable disease interventions
PHC	Primary Health Care
PKH	Private hospital referenced in Tanzania study
PM2.5	Particulate Matter <2.5 microns (air pollution)
POCT / POC	Point-Of-Care Test(ing)
PPP	(1) Purchasing Power Parity; (2) Public-Private Partnership
PTLD	Post-Tuberculosis Lung Disease
PUMUA	Africa PUMUA Initiative (AstraZeneca asthma program; ‘pumua’ = ‘breathe’ in Swahili)
SABA	Short-Acting Beta-Agonist
SABINA	SABA use IN Asthma (study)
SAMA	Short-Acting Muscarinic Antagonist

List of Abbreviations (4/4)

ABBREVIATION	MEANING / EXPANSION
SGBP	State Guaranteed Benefit Program (Kyrgyzstan)
SGLT2	Sodium-Glucose Co-Transporter-2 (inhibitor)
SHA	Social Health Authority (Kenya)
SHIF	Social Health Insurance Fund (Kenya)
SIS	Seguro Integral de Salud (Peru Comprehensive Health Insurance)
SISMED	National medicines supply-chain inventory system (Peru)
SKILLD	Spoken Knowledge In Low Literacy patients with Diabetes
SMBG	Self-Monitoring of Blood Glucose
SMI	Soft Mist Inhaler
SRA	Stringent Regulatory Authority
SUS	Sistema Unico de Saude (Brazil unified health system)
SWOC	Strengths, Weaknesses, Opportunities, Challenges (analysis)
T1D / T1DM	Type 1 Diabetes (Mellitus)
T2D / T2DM	Type 2 Diabetes (Mellitus)

ABBREVIATION	MEANING / EXPANSION
TAI	Test of Adherence to Inhalers
TB	Tuberculosis
TDYA	Tanzania Diabetes Youth Alliance
THANDYS	Tanzania NCD study (Minimum Care Package study)
TIBU	Treatment Information from Basic Unit (Kenya TB data system)
UHC	Universal Health Coverage
UN	United Nations
USD / US$	United States Dollar
USP	Unique Selling Proposition
VCAPS	Vietnam chronic-disease prevention study (study)
WHA	World Health Assembly
WHO	World Health Organization
WLA	WHO-Listed Authority

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Objectives and scope of this report

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OBJECTIVES AND SCOPE

The objective of this work is to translate insulin access lessons to inhaled medicines for asthma and COPD and create recommendations for the broader field

Background

Access to inhaled medicines for asthma and COPD is one of the most persistent and under-addressed gaps in NCD care across low- and middle-income countries (LMICs).

Inhaled corticosteroids (ICS) and combination inhalers - tools that transform daily disease management in high-income settings - remain absent from public facilities or priced beyond reach in many of the countries where they are most needed, leaving millions exposed to avoidable morbidity and premature death.

Diabetes care has been the target of global work documenting the issue and of donors' programs that provided financial support to improve the status quo. Thanks to this, diabetes care and access to insulin and has taken off in many LMICs in recent decades.

This can offer an area of learning for inhaled medicines, considering also the fact that, like inhaled medicines, it also relies on a drug and device combination.

Goals of this report

Learning from access to insulin work in LMICs, in particular from work done through The ACCISS Study and the NCD Policy Lab, this report makes recommendations on how access to inhaled medicines can be improved in LMICs. The recommendations are made for the broader field, but also for specific stakeholder groups that will drive action.

It covers a global analysis as well as deep-dives in four countries: Kenya, Kyrgyzstan, Peru, and Tanzania. The country-level analysis served to ground our findings and recommendations in real-world contexts.



OBJECTIVES AND SCOPE

Although Asthma and COPD diseases cause greater direct mortality than diabetes, they receive a lower level of attention and funding

INDICATOR	DIABETES	COPD / ASTHMA
1 Burden – Yearly deaths	• ~1.6 – 2.0 million direct deaths >> ; >> ; >> (of which, an estimated 174,000 deaths in 2025 are attributed to type 1 diabetes)	• ~3.7 – 3.8 million combined deaths >> ; >> (~3.3M COPD + ~442,000 asthma)
2 Burden – DALYs	• ~79+ million DALYs globally >> ; >> (of which, type 2 diabetes accounts for ~75M+ direct DALYs)	• ~90 million DALYs globally >> (~63.8M COPD + ~26.2M asthma)
3 Burden – Number of patients	• ~589 million individuals and rising >> ; >> ; >> (of which, 9.5 million people are living with type 1 diabetes globally)	• ~563-763+ million combined cases >> ; >> (~200-400M COPD + ~363M asthma)[1]
4 Burden – Undiagnosed patients	• ~252 million adults are undiagnosed >> ; >>; >> (~44% of all adults with diabetes; an estimated 4.1M people with type 1 diabetes will have died early or gone undiagnosed, including ~669k never diagnosed)	• ~572+ million undiagnosed >> (70% of COPD or asthma cases go undiagnosed)
5 Funding – Philanthropic & Donor Aid	• Diabetes attracts significant share of attention and funding, for example (non-exhaustive[2] list): – The National Institutes of Health (NIH) in US allocated $1.15 billion to diabetes research[3] in 2024 >> – Helmsley Charitable Trust has granted over $114 million in research and development aid for Type 1 Diabetes in 2025 >> – World Diabetes Foundation alone provided $19.2 million for development in 2024 >>	• Chronic respiratory diseases receive less funding than conditions like diabetes, with no dedicated global financing mechanism >> . For example (non-exhaustive[2] list): – The NIH allocated only $270 million to asthma research[3] and $158 million to COPD research[3] in 2024 >> – Recent large development aid includes the Preventive and Public Health Research Initiative, which provided AUD 22 million (~US$ 16 million) in 2024 to support 12 projects across Australia for up to five years >> ; >>
6 Ecosystem – Global NGOs & Alliances	• ~240+ member associations globally under the International Diabetes Federation (IDF) umbrella >>	• ~50 major global/regional networks >> • (e.g., Global Allergy & Airways Patient Platform, FIRS, GINA, GOLD, The Union)

1. COPD burden is likely underestimated in the GBD figures
2. Consolidated and comparable figures across diabetes and COPD / Asthma are not available, so some datapoints are shared to support the argument
3. Includes topic, such as pre-clinical, clinical, biomedical, health services, behavioral, and social research.

SOURCE: In-line with text; Team analysis

OBJECTIVES AND SCOPE

DETAILS ON NEXT PAGES

Scope: The work focuses on inhaled medicines with limited access in LMICs; we consider a global view but also deep-dive into 4 countries

The objective of the project was to **translate insulin access lessons to inhaled medicines for Asthma and COPD** and create **SMART recommendations** targeted to specific stakeholder groups: governments, regional bodies, global health agencies, industry, and professional associations

1. Within **inhaled medicines**, this report directs its focus on long-term therapies that improve the quality of life and reduce risk of mortality, especially from asthma (vs. short-term reliever therapies which already have considerable reach in LMICs, and are misused)

2. In addition to a global view, the following countries will be the focus of deep dives: **Kyrgyzstan, Peru, Kenya and Tanzania**

   Kyrgyzstan, Peru and Tanzania are part of the long-standing ACCISS project which provides a valuable repository for learning

   Kenya was included due to efforts on insulin and inhaled medicines



SOURCE: Project RFP, discussion with the Union team

OBJECTIVES AND SCOPE

1 For this work, we focus on specific categories of inhaled medicines with high impact and low penetration (ICS, LABA and ICS-LABA combinations, with partial coverage to LAMAs)

CATEGORY	NOTES	RATIONALE FOR INCLUSION
ICS (inhaled corticosteroid) *e.g., beclomethasone, budesonide, fluticasone*	• Anti-inflammatory controller therapy; essential maintenance medicine for asthma	• Large number of patients do not/ can not access despite need
LABA (Long-Acting Beta$_2$ Agonist) drugs *e.g., formoterol*	• Inhaled bronchodilators that relax airway smooth muscle for 12–24 hours, helping keep airways open in asthma and COPD. In asthma, LABAs are used with an inhaled corticosteroid (ICS) to prevent symptoms; in COPD, they are a core maintenance therapy and may be used alone or in combination with other inhalers.	• Large number of patients do not/ can not access despite need; usually in EMLs in combination with ICS
ICS+LABA combination	• Combination controller inhaler used in moderate–severe asthma and in COPD; specifically, ICS + Formoterol	• Large number of patients do not/ can not access despite need
LAMA (long-acting muscarinic antagonist) *e.g., tiotropium*	• Long-acting bronchodilator, primarily for COPD	• Limited coverage – relevant for many COPD patients but higher costs than LABA alone, lower inclusion in EMLs

Exclusions

- SABA (short-acting beta-agonist) e.g., salbutamol are not included. They are rescue inhalers used to relieve acute symptoms which are commonly available in LMICs. Often, they are misused as long-term therapy or used as the only therapy
- LAMA+LABA / triple therapy (LAMA+LABA+ICS): These are combination inhalers used in moderate–severe COPD. Excluded as limited number of patients need triple therapy + they are prohibitively expensive for meaningful access in LMICs

SOURCE: Team analysis

OBJECTIVES AND SCOPE

2 Countries selected for detailed analysis have several differences in their health systems (1/2)

	Kenya	Tanzania	Kyrgyzstan	Peru
GDP/capita $ (PPP)	• 7,016 >>	• 4,471 >>	• 9,220 >>	• 18,816 >> (upper middle-income)
Health spending / capita ($ PPP)	• 274 >>	• 119 >>	• 349 >>	• 956 >>
General Public System Structure	• System organized into six levels, decentralized system: >> › Primary (Level 1: Community services, Level 2: Dispensaries and clinics, Level 3: Health centers, Level 4: Primary care hospitals) – *counties responsible* › Secondary (Level 5: Secondary care hospitals) - – *counties responsible* › Tertiary (Level 6: Tertiary care hospitals)	• Highly decentralized health system; districts responsible for budgeting, organizing, managing public health facilities >> • Three levels: >> › Primary level – decentralized (Community-based services, dispensaries, health centers, and district hospitals) › Secondary level (Regional referral hospitals) › Tertiary level (Zonal referral hospitals, specialized hospitals, and national hospitals)	• System organized into two levels: >> › Regional or oblast level › Primary health care (Represented by family medicine centers) › Secondary health care (Represented by territorial hospitals) › National or republican level - Tertiary health care	• System organized into three levels: >> › Primary Level of Care (Health posts and health centers) › Secondary Level of Care (General hospitals) › Tertiary Level of Care (National reference and specialized hospitals)

SOURCE: In-line with text; Team analysis

OBJECTIVES AND SCOPE

2 Countries selected for detailed analysis have several differences in their health systems (2/2)

	Kenya	Tanzania	Kyrgyzstan	Peru
Out-Of-Pocket spending (%)	• 24% >>	• 28% >>	• 42% >>	• 27% >>
Insurance coverage details, including for NCDs	• Social Health Authority (SHA) operates through three separate funds >> ; >> • Primary Healthcare Fund: Tax-funded; provides free primary healthcare • Social Health Insurance Fund (SHIF): Citizens contribute 2.75% of their income/Salary to SHIF[1] • Emergency, Chronic and Critical Illness Fund: Tax-funded; emergency / critical care	• Moving towards UHC, but currently older structures remain (see below) • National Health Insurance Fund (NHIF) open for all groups, including students, children, and adults with three-coverage tiers >> • Improved Community Health Fund (iCHF) for informal/rural population. Benefits are less predictable because access depends heavily on what the local facility has available and procures >>	• The State Guaranteed Benefit Programme (SGBP), people are entitled to free (at the point of care) emergency care, free primary care (including a limited selection of medicines), free outpatient specialist care with referral, and inpatient care with referral and co-payments >> • The Mandatory Health Insurance Fund (MHIF) provides additional outpatient drug packages at 50% reimbursement rate >> (R8)	• Two main payors: Seguro Integral de Salud (SIS) and EsSalud • SIS is mainly tax funded, covers clinical consultations, essential diagnostics, and basic NCD medications >> • EsSalud, mainly payroll funded, more comprehensive vs. SIS. Covers outpatient care, specialized clinical follow-ups, essential medications, and even certain medical self-monitoring devices free of charge >>
Public procurement arrangements	• KEMSA (Kenya Medical Supplies Authority) is the key purchasers of health commodities >> • Counties source about 70% of medicines from KEMSA, 28% from the faith-based org, MEDS, and 2% from the private market >>	• Medical Stores Department (MSD) is Tanzania's central procurement agency for health commodities. However, District Medical Officers and local health facility boards having autonomy over local budgets and the authority to prioritize and procure medicines via the MSD (R12)	• Kyrgyzpharmacia under MoH procures medicines in bulk directly from manufacturers at discounted prices for distribution to state medical facilities and the general population. >> (R8) • Individual health facilities can also directly purchase and procure their own drugs >>	• CENARES handles both centralized and decentralized purchases depending on the facility and product, working off the national essential medicines list and National medicines supply-chain inventory system (SISMED), the national supply chain inventory system >> • Regional governments have limited independence in procurement decisions (compared to staffing and other functions) >>

1. Benefits include outpatient care, chronic care, maternity, oncology, and mental health

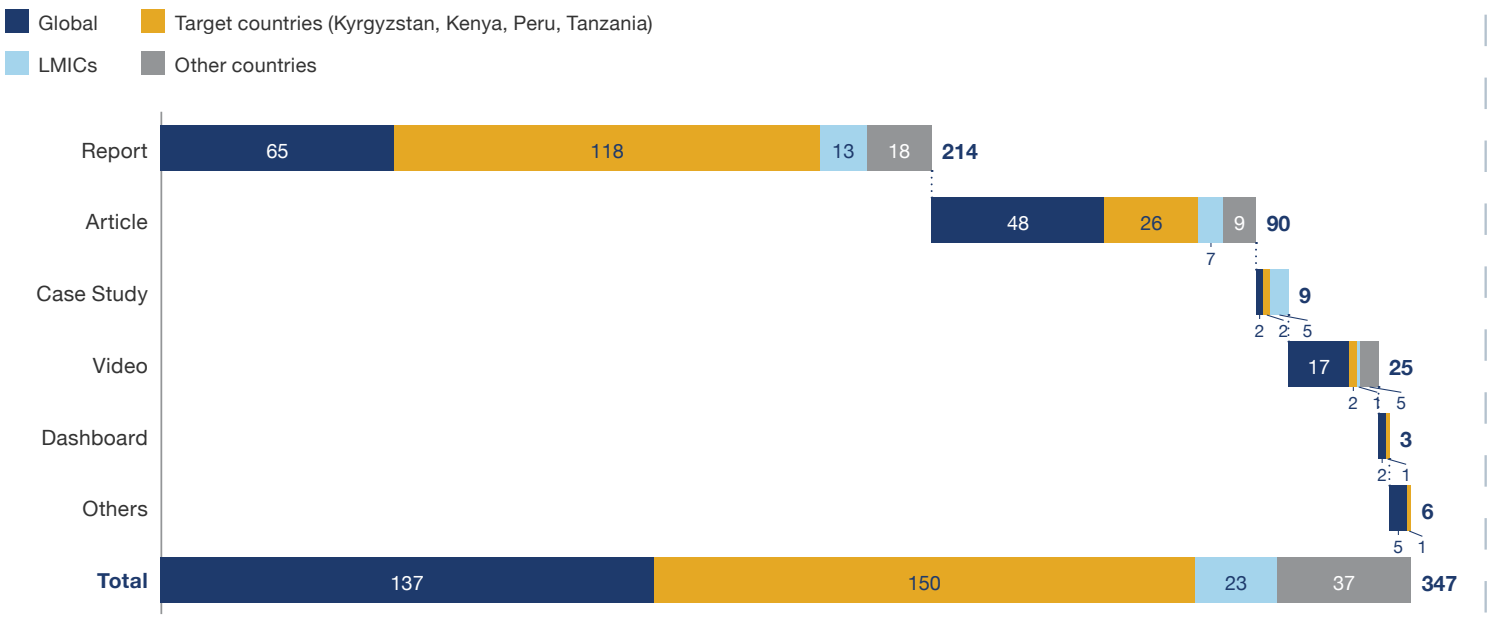
SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

OBJECTIVES AND SCOPE

We relied on a detailed desk review and 16 primary expert interviews for this work

Desk review

Over 340 resources were reviewed



Key Informant Interviews

We conducted 16 interviews with global and in-country stakeholders

- Global stakeholders including from WHO, CHAI, NCD Policy Lab, Pharma companies, relevant respiratory groups (GOLD/GINA)
- Country stakeholders (Kenya, Kyrgyzstan, Peru, Tanzania) including non-profits leaders focused on insulin/inhaled medicines, respiratory leaders, and Ministry of health officials

In addition, inputs were received weekly by the project steering group that included members from The Union, Every Breath Counts, FIRS and NCD Policy Lab

SOURCE: Team analysis

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04

THE INSULIN ACCESS STORY

Background and current state

Background and current state
Global and cross-country challenges
Country-specific challenges
Selected initiatives



Diabetes imposes a large burden on LMICs; insulin is required for all Type 1 Diabetes patients and for significant proportion of Type 2 Diabetes patients

Condition: Diabetes mellitus is a chronic metabolic disease characterized by persistently elevated levels of blood glucose (hyperglycemia) resulting from cellular resistance to insulin, inadequate insulin secretion by the pancreas, or both >>

- **Type 1 Diabetes (T1D)**: An autoimmune disorder in which the body's immune system selectively attacks and destroys insulin-producing beta cells in the pancreas, leading to absolute insulin[1] deficiency >>
- **Type 2 Diabetes (T2D)**: A progressive condition characterized primarily by insulin resistance and inadequate beta cell insulin secretion. It accounts for the majority of diabetes cases >>

LMIC Burden: ~80% of adults with diabetes worldwide live in LMICs, yet fewer than 1 in 10 receive guideline-based comprehensive treatment there >> ; >>

Diagnosis: Diabetes is diagnosed using blood tests such as HbA1c, fasting plasma glucose, the 2-hour plasma glucose test during an oral glucose tolerance test, and random plasma glucose (RPG). T1D is further confirmed through autoantibody testing >> ; >>

Treatment pathway:

T1D requires lifelong insulin therapy from diagnosis, using long-acting insulin injections or an insulin pump, along with glucose monitoring, nutrition and physical activity counselling, and education on preventing hyperglycemia and diabetic ketoacidosis >> ; >>

T2D management begins with lifestyle modifications, including a healthy diet, regular physical activity, and weight management where appropriate, alongside metformin as the preferred first-line pharmacological therapy. If glycemic targets are not achieved with metformin alone, or if metformin is contraindicated, a sulfonylurea such as gliclazide is recommended as second-line treatment. Insulin is introduced if glycemic targets remain unmet despite oral therapy, or earlier in cases of severe symptomatic hyperglycemia >> ; >>

Global guidelines relevant to LMICs:

WHO PEN (Package of Essential Noncommunicable Disease Interventions): Contains simplified treatment protocols for T2D designed for delivery by primary healthcare workers in low-resource settings, with a core list of essential medicines and technologies >>

WHO PEN-Plus: Extends WHO PEN to district hospitals, training mid-level providers (nurses, clinical officers) to manage severe chronic NCDs including T1D >>

Note: A new WHO guideline on type 1 diabetes management is expected soon

1. This includes: Human insulin: Regular (short-acting), NPH (intermediate-acting), and premixed (e.g., 30/70); generally the most affordable and widely available, particularly in LMICs; Insulin analogues: Rapid-acting (lispro, aspart, glulisine) and long-acting (glargine, detemir, degludec); offer improved pharmacokinetic profiles but are typically more expensive; Biosimilar insulins: Lower-cost alternatives to originator human and analogue insulins, supporting improved affordability and access, especially in LMICs.

SOURCE: In-line with text; Team analysis; additional details and sources on dedicated pages

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04

THE INSULIN ACCESS STORY

Global and cross-country challenges

Background and current state

Global and cross-country challenges

Country-specific challenges

Selected initiatives



Key considerations about global challenges: Financing nascent/fragile and challenges in service delivery centralization, affordability and stock-outs (in part due to market structure)

KEY ISSUE	DRIVER	DETAILS
Financing / political prioritization at country level nascent + fragile	**n/a**	• Most LMICs have only **recently started addressing NCDs**: within these the focus is on hypertension, diabetes and cardiovascular conditions. Due to changes in global health donor funding, even this progress is under threat in several countries >> ; (R5)
Challenges in service delivery and affordability	**Although primary care integration is underway, service delivery is still centralized**	• **Deficiencies in Healthcare Systems & Community Education:** A shortage of trained primary healthcare workers creates a "fear of prescribing" insulin, while poor community screening, low health literacy, and lack of awareness about symptoms or government entitlements delay diagnosis and treatment. >> ; >> ; >> • **Centralized Care & Geographic Isolation:** Diabetes care is heavily centralized in major city hospitals, forcing patients to endure long travel distances and unaffordable transportation costs just to receive routine care or collect medication including insulin >>
	Frequent stock outs and cold-chain challenges	• **Fragile Supply Chains & Frequent Stockouts**: Supply is often disrupted by inadequate public sector availability and an inappropriate **cold-chain refrigeration** infrastructure. In addition to this, monitoring devices often use proprietary formats, preventing interoperability and increasing the impact of stock-outs. (see last point in limited competition) >> ; >>
	Affordability is still a challenge in most LMICs	• **Prohibitive Costs & Financial Barriers:** Price of insulin remains high due to several reasons, including market domination by a few players and lack of local competition, complicated supply chains with mark-ups at each step (including taxes and tariffs), lack of pooled procurement. Monitoring tools are also expensive and their proprietary formats limit competition and interchangeability among suppliers. In addition to this, health insurance coverage is often incomplete or absent for insulin, and also for the monitoring supplies the patients need >> ; >>
	Markets in LMICs have been distorted by donations	• 1 **Limited competition**: The dominance of the big 3 via donation and access prices may have stifled the entry of new players. Biosimilars/generics have not had the business case to enter LMIC markets in a meaningful way >> ; >>

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

1 The insulin landscape in LMICs has been dominated by the Big 3 globally through donations and tiered pricing in LMICs

TYPE	KEY COMPANIES	BUSINESS FOCUS IN HICS	LMIC FOCUS
Originators/ Branded	Novo Nordisk, Sanofi, Eli Lilly	• Combined shared of ~90% in most markets >> • More focus on long-acting analogues (e.g., Lantus, Tresiba, Toujeo) and once-weekly insulin formulations for high income markets >> • US, Europe, Canada are the major markets, also present in Middle-Income Country >> • Moving towards GLP-1 (e.g., semaglutide, tirzepatide) >> ; >>	• Sizable LMIC presence through donations and capped pricing (mostly human insulin for T2D, some analogue for T1D). • Focus on reputation and cost-recovery; high volumes decrease unit costs thereby increasing profits in HICs >>
Generics/ biosimilars	Biocon (India), Wockhardt (India), Gan & Lee Pharmaceuticals (China), Fosun (China), etc.	• High-volume production of affordable biosimilar human and analogues insulin >> • Competing primarily on price and government tender access >> • Strong presence in home markets (e.g, India, China), also focus on HICs where they have approvals for analogues >>	• Broader LMIC presence beyond home markets very selective/ opportunistic (commercially motivated, largely human insulin): Some presence in Asia-Pacific, Latin America, Middle East and North Africa, and Sub-Saharan Africa >> • Branded pharma's low pricing makes commercial case unattractive in many cases >> • Human insulin for most producers is not SRA registered, hence registration in LMICs requires lots of effort >>

SOURCE: Team analysis, data source in-line with text

1 Several challenges have prevented additional insulin producers from entering LMIC markets till date; situation may change in the coming years

- **Uncompetitive Pricing in Practice:** For an alternative insulin to disrupt the market, it must offer a clear financial advantage. If biosimilar products are not significantly cheaper than the originator insulins in LMICs, patients may not see the case for changing their treatment plan, making it difficult for biosimilars companies to increase uptake of – and trust in – their products among prescribers and users >>.
  - For example, when Uganda procured "Wosulin N", an insulin from the Indian firm Wockhardt, the price was almost identical to the price of Novo Nordisk's insulin, meaning the government achieved negligible savings by switching >>
  - Sri Lanka switched from Novo Nordisk to Wockhardt and cut prices by 30–60%, but Uganda achieved no biosimilar saving because the local-agent mark-up matched Novo Nordisk's price >>
- **Complex Regulatory Hurdles:** For biological products, such as insulin, regulatory approval is more complex than for simple molecules; the process of regulatory assessment is demanding and includes the need for clinical trials. These requirements increase the entry cost of biosimilar products into the market >>
- **Lack of Trust and Brand Loyalty:** There is a behavioral barrier driven by perceived quality and aggressive marketing. Multinational companies have spent decades building wide physician networks and establishing brand loyalty, which makes it very difficult for newer biosimilar companies to compete. For example, within India, studies show that Indian doctors, wholesalers, and patients often prefer foreign-made insulins, believing them to be superior to those manufactured domestically >>. A survey of insulin users in Tanzania found comments like, "From my experience, Novo Nordisk is the best," showing strong trust and brand loyalty even though the different companies work about the same >> ; >>
- **This situation may be changing:** Given changes in priorities of Big 3, there is more interest in WHO's Prequalification Process which would facilitate easier access to LMICs (R7)

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

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04

THE INSULIN ACCESS STORY

Country-specific challenges

Background and current state
Global and cross-country challenges
Country-specific challenges
Selected initiatives



How diabetes care is organized in Kenya

DIMENSION	CONSIDERATIONS ABOUT THE HEALTH SYSTEM
General Public System Structure	• Kenya features a decentralized, six-tiered health system managed by the Ministry of Health and 47 county governments, ranging from Level 1 (community units) and Level 2 (dispensaries) up to Level 6 (national referral hospitals) >>
Medication Access & Supply	• The public sector is mandated to provide a basic package of care, and procurement should be carried out by the Kenya Medical Supplies Authority (KEMSA) >>
Insulin Patient Entitlements & Conditions	• Insulin and other NCD services are now covered under SHA/SHIF. Access to these benefits is contingent upon payment of monthly premiums set at 2.75% of monthly income, with a minimum contribution of KES 300 (approximately US$2.5) per month. • Under the public-private Base of the Pyramid (BoP) project, patients in participating counties like Meru are entitled to a strict price ceiling of 500 to 600 Kenyan Shillings (about $5) per vial for specific insulins like Mixtard >> ; >> ; >> • In addition, free insulin donation program provides free insulin to patients aged 18 years or younger, although discussions are underway to extend eligibility to 21 years of age >> (R11)



SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

Key challenges to insulin access in Kenya: Major gaps in financing, limited or delayed diagnosis, and poor treatment adherence due to stock-outs and incorrect beliefs among those diagnosed

Cross-cutting factors

- **National funding gap & limited Insurance:** The gap in funding for diabetes patients is estimated to be 95%, limiting what the government can provide. The monthly premiums for the national health insurance scheme (300 KES, about 2 USD) are unaffordable for many, and those who are covered, face discrimination by clinics favoring cash-paying patients, or are wrongfully turned away by staff who do not know about entitlements >> ; >> ; >>
- **Shortage of specialists & futile referrals**: A critical shortage of NCD specialists and properly trained clinicians results in rushed consultations and massive clinic queues that cost casual laborers their daily wages. Because public facilities are so frequently out of stock, community referrals are often seen as pointless, driving an alarming trend where only 42% of patients maintain continued long-term follow-up within the public sector >> ; >>

Low screening and diagnosis rates

- The six-tier health system requires rural patients utilize Level 2 dispensaries or Level 3 health centers for primary NCD screening before hospital referral. As many rural clinics lack basic blood glucometers, reliable drug stocks, or specialized staff, patients experience diagnostic bottlenecks and must bypass primary clinics to access better-equipped private or Level 4 urban facilities >> ; >>
- Missing basic diagnostic tools like glucometers (available in as few as 11% of facilities in some counties) lead to missed cases >>

Among limited people diagnosed, challenges in appropriate treatment and adherence

- **Inconvenient local supply and storage challenges:** National policies restrict insulin stock to higher-tier Level 4 hospitals, leaving local primary care clinics completely unstocked and missing basic diagnostic tools like glucometers (also needed for monitoring). This forces patients to travel long distances, up to 300km, to access care, only to face the secondary hurdle of trying to store the medication at home without refrigeration. >> ; >>
- **Stockouts:** Chronic administrative delays at the KEMSA frequently result in medicine stock-outs. Due to public sector drug stock-outs, patients must purchase their NCD medications at retail prices from private pharmacies and community chemists >>
- **Low Literacy, Stigma, & Psychological Resistance**: Fewer than 38% of patients possess basic diabetes literacy, which, combined with intense community stigma and a fatalistic view of diabetes as an inevitable “death sentence,” causes individuals to hide their condition or avoid screening entirely. For those prescribed insulin, deep psychological resistance, fear of permanent lifestyle restrictions, weight gain, and hypoglycemia contributes to a 72% treatment non-compliance rate >> ; >>
- **T1D transition challenges:** The CDiC free insulin donation program provides free insulin only to patients aged 18 years or younger, although discussions are underway to extend eligibility to 21 years of age (R11)

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

How diabetes care is organized in Kyrgyzstan

DIMENSION	CONSIDERATIONS ABOUT THE HEALTH SYSTEM
General Public System Structure	• Kyrgyzstan's health system is organized into national (Republican), regional (Oblast), and district (Rayon) levels, with primary care delivered predominantly by Family Medicine Centers (FMCs) and General Practice Centers >>
Medication Access & Supply	• Kyrgyzstan implements a State-Guaranteed Benefit Package (SGBP) that provides free primary care for all citizens and **guarantee the free provision of insulin and essential NCD medications**. >> ; >> • Kyrgyzpharmacia under MoH procures medicines in bulk directly from manufacturers at discounted prices for distribution to state medical facilities and the general population. Procurement of insulin is done through Kyrgyzpharmacia >>
Insulin Patient Entitlements & Conditions	• The SGBP legally **guarantees people with diabetes free primary care, free insulin and injection devices for all citizens in need**, distributed centrally by the Ministry of Health. >> • However, because of the insufficient funding, insulin cartridges are only purchased for children until the age of 18 years of age. Adults with diabetes use insulin in vials >>

SOURCE: In-line with text; Team analysis

Key challenges to insulin access in Kyrgyzstan: Insufficient government budgets; many missed / delayed diagnoses; specialist driven treatment drives access issues and out of pocket spending

Financing inadequate to meet mandates

- Significant funding gap lead to supply shortages, forcing patients to buy diagnostic supplies and oral drugs out-of-pocket >> ; >>

Missed/delayed diagnosis

- **Ineffective Early Detection & Endocrinologists' bottleneck**: Family doctors frequently lack the commitment or professional knowledge to screen, identify, and register diabetes early, especially in rural areas. Patients are mostly referred to the scarce regional endocrinologists (only 0.2 specialists per 10,000 people). This results in a about 28% undiagnosed rate for type 2 diabetes and forces most patients to rely on self-referrals only after the disease has progressed. >>

Among those diagnosed, challenges in appropriate treatment and adherence

- **Highly Centralized Care**: Diabetes care is strictly hospital- and specialist-driven. Patients outside major hubs must travel long distances to district centers to see an endocrinologist or to receive a supply of insulin (covering 2 months max) free of charge, if it is available in stock. Additionally, HbA1c testing coverage was low nationally at 30–36% of diabetes patients in 2021–2022, but the regional gaps were even starker, with coverage falling to just 3.7% in Issyk-Kul and 7.7% in Ton in 2022, both far below the national average >> ; >> ; >>
- **Catastrophic Out-of-Pocket Costs & Severe Underfunding**: Despite a legal mandate for free care, due to insufficient budget allocation, what patients require is sometimes not available, forcing patients to pay out-of-pocket for essential tools like syringes, needles, and medications. Diabetes medications receive 61% average reimbursement, leaving patients to pay 39% out-of-pocket. About 31% of diabetes patients are likely to face catastrophic health spending, and a low-wage worker would have to work more than an entire month to afford a single month's supply of private insulin when public stocks fail >> ; >> ; >>
- **Inappropriate Supply Planning & Inadequate Infrastructure**: Demand estimates are made based on consumption of previous years rather than patient demand. This can lead to severe regional shortages alongside wasted, expired stock, which is further worsened by a lack of proper cold-chain refrigeration infrastructure to safely store inventory at local clinics >>

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

How diabetes care is organized in Peru

DIMENSION	CONSIDERATIONS ABOUT THE HEALTH SYSTEM
General Public System Structure	• Peru utilizes Modelo de Atencion Integral de Salud (Peru integrated health-care model), tiered healthcare framework that organizes medical services into primary, secondary, and tertiary levels based on patient complexity, though the system remains highly fragmented across different provider networks >> ; >>
Medication Access & Supply	• Peru's healthcare financing is segmented, primarily utilizing the public health insurance ("Seguro Integral de Salud" or SIS) for low-income populations and social security (EsSalud) for formally employed workers. Medicines for chronic diseases, such as human insulin and metformin, are supposed to be provided free of charge to patients affiliated with SIS and EsSalud. >> ; >>
Insulin Patient Entitlements & Conditions	• Patients covered by SIS and EsSalud are entitled to standard human insulins (NPH and regular), metformin, and glyburide at no cost, with plans to procure insulin analogues from 2026-2027 onward. However, diabetes care remains highly centralized, with insulin provision restricted to secondary and tertiary hospitals, effectively preventing access through primary healthcare facilities. >> ; >>

SOURCE: In-line with text; Team analysis

Key challenges to insulin access in Peru: High centralization affects remote populations; low diagnosis rate, limited access to insulin with high out of pockets costs when supply fails

Cross-cutting factors

- **Extreme Centralization & Barriers for Indigenous Populations**: Healthcare resources are heavily concentrated in the capital, with 60% of Peru's scarce endocrinologists practicing exclusively in Lima. Patients in outer regions face long travel times and complex system navigation, while indigenous Quechua populations face additional geographic terrain, linguistic barriers, and perceived discrimination that fuel deep health system mistrust >> ; >> ; >>

Low screening and diagnosis rates

- Rural primary care facilities, such as those in the department of Puno, lack functioning diagnostic equipment, trained specialists, and essential medicines like insulin >>

Among those people diagnosed, challenges in appropriate treatment and adherence

- **Limited availability of insulin and tracking tools**: Insulin is completely restricted to major hospitals and is absent at the primary healthcare level. Driven by inaccurate historical forecasting, the public sector faces a 25% insulin unavailability rate (and 55% in the private sector); only 7% of pharmacies have insulin in stock. Basic tracking tools like glucometers are also hardly available: in the public sector, glucometers are available at 4% of facilities, test strips in 21% (with private sector marginally better, with availability at 43% and 38% respectively) >> ; >> ; >>
- **High out-of-pocket costs**: Even though insulin is technically free in the public sector, chronic stockouts force families to buy supplies from private pharmacies where human (27 USD for 1,000 IU) and analogue insulins (53-71 USD for 1,000 IU) are very expensive >>
- Since December 2025, Peru has also faced an acute national insulin shortage after the national regulator suspended biosimilar supplier over manufacturing quality violations, disrupting insulin supplies across the public health system >>

SOURCE: In-line with text; Team analysis

How diabetes care is organized in Tanzania

DIMENSION	CONSIDERATIONS ABOUT THE HEALTH SYSTEM
General Public System Structure	• Tanzania's public health system is organized hierarchically in line from dispensaries at the lowest level through health centers and district hospitals up to regional, zonal referral, and national hospitals >>
Medication Access & Supply	• Tanzania is transitioning toward universal health coverage (UHC), although the National Health Insurance Fund (NHIF) and Community Health Fund (CHF) remain the primary financing mechanisms. Government policy exempts patients with chronic diseases from user fees at public health facilities. (R12) >>; >> • As the transition continues, the prevailing system is: – NHIF is Tanzania's main public health insurance scheme and is open for all groups, including students, children, and adults. It requires annual premiums, which may be paid by the individual or by an employer, and it provides a defined reimbursement package that covers essential care for chronic diseases like diabetes, including insulin and basic monitoring services >> – CHF is a community-based scheme meant mainly for households in the informal and rural sectors. It also requires an annual contribution, and it is intended to give members access to care at public facilities and entitles its members to receive free insulin, but in practice its benefits are less predictable than NHIF because access depends heavily on what the local facility has available and procures >> • Medical Stores Department (MSD) is Tanzania's central procurement agency for health commodities. District Medical Officers and local health facility boards having autonomy over local budgets and the authority to prioritize and procure medicines via the MSD (R12)
Insulin Patient Entitlements & Conditions	• Patients enrolled in the NHIF are entitled to a monthly reimbursement covering human insulin, five syringes, and 25 glucose test strips, three HbA1c tests per year, two to three lipid level tests, and an annual eye check. Uninsured youth receive free insulin through donor programs like Life For A Child (LFAC), but uninsured adults must navigate public supply shortages or face out-of-pocket co-payments >> • Government tenders involve three to four generic/biosimilar suppliers competing against branded products (R12) • The free insulin donation program provides free insulin to patients aged 25 years or younger >>

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

Key challenges to insulin access in Tanzania: High centralization; low diagnostic rates; among those in treatment, withholding beliefs, poor supply, high out of pocket spending limit adherence

Cross-cutting factors

- **Geographic Isolation & Centralized Care**: in rural Tanzania, diabetes care is centralized at referral and district facilities, leaving lower-tier primary care facilities unequipped to diagnose and manage the disease; >60% patients reported transportation costs as a significant challenge for their routine follow-up visits. At the district level, care is further constrained by poor coordination, supply gaps, and weak HMIS systems that undermine patient tracking and procurement planning >>

Low screening and diagnosis rates

- **Low Health Awareness:** estimates suggest that 60% of Tanzanians with diabetes are not diagnosed due to low screening and general unawareness of symptoms. Due to lack of type 1 awareness, their symptoms among children are frequently mistaken for cerebral malaria, pneumonia, or meningitis. >> ; >>

Among people diagnosed, challenges in appropriate treatment and adherence

- **Frequent Stock-outs**: average unavailability of insulin is estimated to be 18.9% and 27.3% in the public and private sector respectively (estimates from other sources vary) >>
- **Prohibitive Out-of-Pocket Costs & Lack of Insurance**: the National Health Insurance Fund (NHIF) covers only 8% of the population, and only 1% has private insurance; most patients are not even aware of the small entitlements they can get from the government. This forces patients to pay completely out-of-pocket, imposing a financial strain on them and their families >>
- **Poor Self-Management**: knowledge for self-management is very limited. Patients are known to share their prescribed insulin with friends in need, forget about their routine injections, make inappropriate food choices >>

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

04

THE INSULIN ACCESS STORY

Selected initiatives

Background and current state
Global and cross-country challenges
Country-specific challenges
Selected initiatives



Most global/multi-country initiatives are supported by big 3 insulin firms; programs include donations and lower pricing with higher attention to Type 1 Diabetes

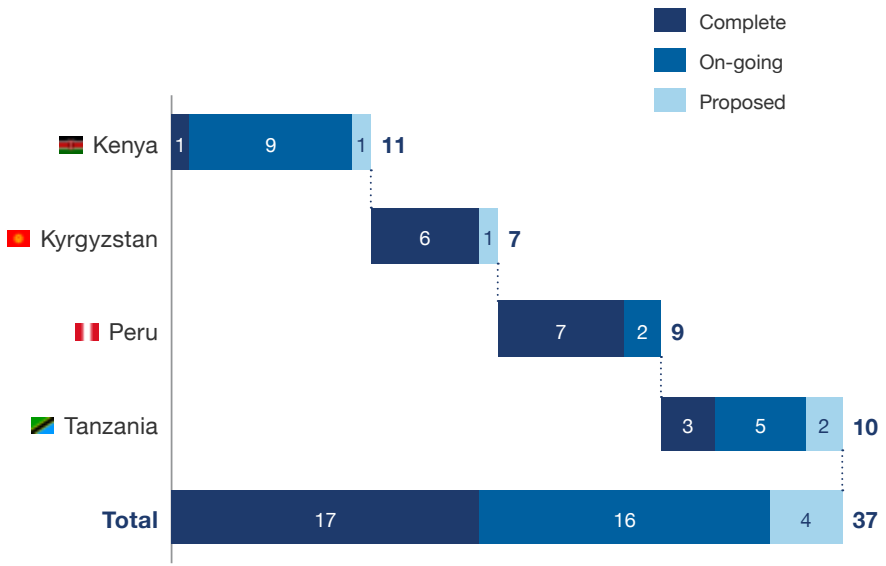
NAME	DESCRIPTION
iCARE initiative	• **Novo Nordisk's** business-integrated access initiative (launched in 2021) that aims to expand insulin access across sub-Saharan Africa by improving affordability, supply chains, healthcare capacity, and patient empowerment >> • Supports health systems through healthcare worker training, demand forecasting, last-mile distribution improvements, and provision of refrigeration equipment to strengthen the insulin cold chain >>
Diabetes CarePak	• PATH-led initiative that bundles insulin with essential diabetes supplies, including glucose meters, test strips, syringes, needles, and educational materials, into a single co-packaged solution >> • Designed to reduce supply chain fragmentation and improve access to affordable insulin self-care tools at the primary care level, with pilots supported by **Novo Nordisk and Sanofi** >>
Life for a Child (LFAC) program	• Global donor-supported program was initiated by the **International Diabetes Federation.** Since 2018, it has been under the support of Diabetes New South Wales, providing children and young adults with type 1 diabetes in resource-limited settings with insulin, monitoring supplies, and diabetes education >> ; >> • Combines donated insulin, blood glucose monitoring equipment, healthcare worker training, and health system capacity building through partnerships with Eli Lilly, Roche, and other global organizations >>
Sanofi Global Health Unit (Impact Brand)	• **Sanofi's** not-for-profit Global Health Unit (launched in 2021) improves access to 30 essential medicines, including analogue insulins, across 40 LMICs by supplying products under its lower-cost Impact brand at affordable access prices >> • The initiative complements affordable insulin with health system strengthening through healthcare innovation funding, partnerships for affordable blood glucose monitoring, and a target to expand analogue insulin access from 15,000 patients (2021) to 300,000 by 2030 >>
Changing Diabetes in Children (CDiC) program	• Public-private partnership launched by **Novo Nordisk** in 2009 to improve access to comprehensive type 1 diabetes care for children and adolescents in LMICs through free insulin, clinic strengthening, healthcare worker training, and patient registries >>

SOURCE: In-line with text; Team analysis

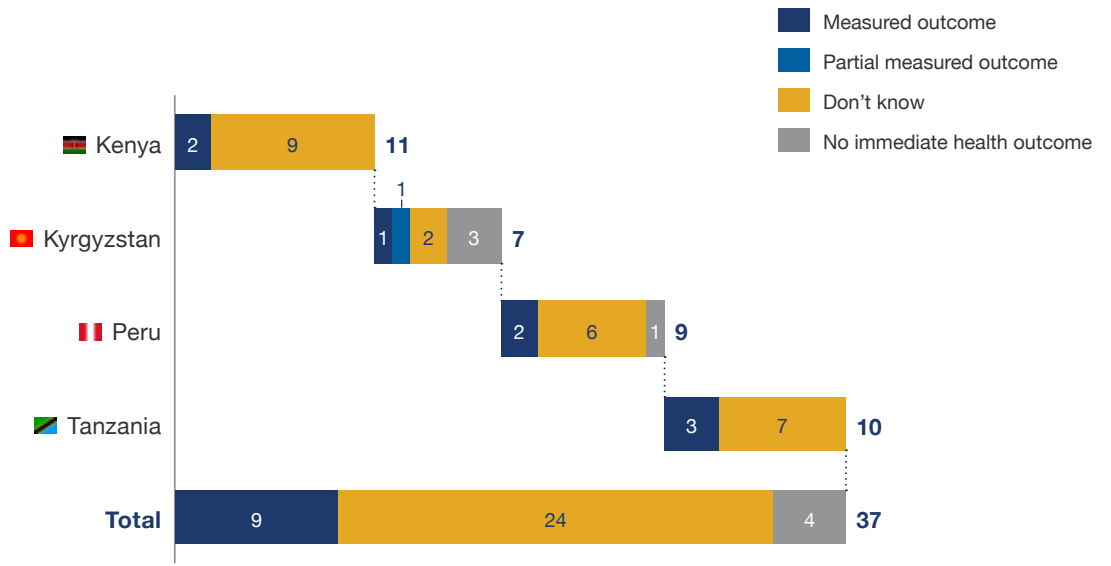
In our research of possible solutions for insulin access in the target countries, we identified a total list of 37 initiatives

Target country

Initiatives split by status, #



Initiatives split by outcome, #



Notes

"Measured outcome" is defined as a measured outcome on the care cascade. The "Don't know" refers to lack of such a measurement

Of the 9 initiatives with measured outcome, only 2 operated at scale. The others had narrow scope and / or were part of a randomized test

The flag "No immediate health outcome" can include initiatives which could act as enablers in the future (e.g., updating clinical guidelines), but they did not lead to outcomes directly

Note: All initiatives are presented in detail in the annexures

SOURCE: Team analysis

Summary of key considerations about initiatives for insulin access (all target countries): Limited number of holistic initiatives led to some, but limited, success

Learning from (partial) successes

- Only **2 initiatives had impact at scale** (deep dive on the following pages). **Centralized procurement** actively driving negotiations seem to work to negotiate insulin prices down, and **insulin price-capping in the context of a holistic private-public partnership** seems to improve insulin supply stability and accessibility >>
- Among those **not operating at scale**:

  Dedicated "**insulin days**" (as they did in Tanzania every 50 days) helped bundling education, free intermediate/ short-acting therapy, and monitoring supplies, led to 82% of surveyed patients avoiding further hospitalizations and successfully returning to work >>

  Offering **free insulin** and updating the **clinical guidelines** to include correct monitoring helped some patients and put the enablers in place for future improvements, but **without enough funds** to implement it, it can prevent governments to deliver on their promise and force patients to revert to the expensive private sector and pay out-of-pocket (as it happened in Kyrgyzstan) >>

  Donation programs (also including training for patients) without sustainable transition pathways will terminate their impact as soon as **funding ends** >>

  Financial incentives for weight loss proved effective, if funds are available >>

Learning from initiatives without the expected outcome:

- **Data registries fail if planners do not use them**: The Kyrgyzstan National Diabetes Registry was set up to track patients for procurement planning, but it failed because planners ignored the registry data, relying instead on historical purchase data only >>
- **Centralized education does not automatically scale to rural areas**: Kyrgyzstan's "Schools of Diabetes" patient education programs operated successfully in the capital of Bishkek but completely failed to operate at the rural primary healthcare level >>
- **Peru tried to use a Swiss mHealth app to support patients** (especially about improving their diet), but no measurable impact was detected. Patients needed more time to assimilate more complicated concepts like carbs counting >>

SOURCE: In-line with text; Team analysis

In 2023, Kyrgyzstan moved from tenders to negotiations for insulin procurement, also opening to biosimilars...

Between 2019 and **2022**, human and analogue **insulin was procured directly by the Kyrgyzstan government through tenders**, where biosimilars were not allowed. Until then, **only branded products from Novo Nordisk and Sanofi** were offered from the tenders and, eventually, purchased. >>

In **2023**, the Ministry of Health established **"KyrgyzPharmacia" as the single state procurement agency** tasked with purchasing pharmaceuticals and medical supplies for healthcare facilities in Kyrgyzstan. Its strategy was different, as it moved **from tenders to negotiations** with all manufacturers. >>

Interestingly, the suppliers of insulin did not change (they remained Novo Nordisk and Sanofi), but **2 additional products** were procured within the portfolio:

Trurapi: a biosimilar version from Sanofi of Novo Nordisk's Aspart (NovoRapid) >>

Insulin Glargine Impact: the not-for-profit brand from Sanofi >>, which offers the same of their own Glargin (Lantus) product >>

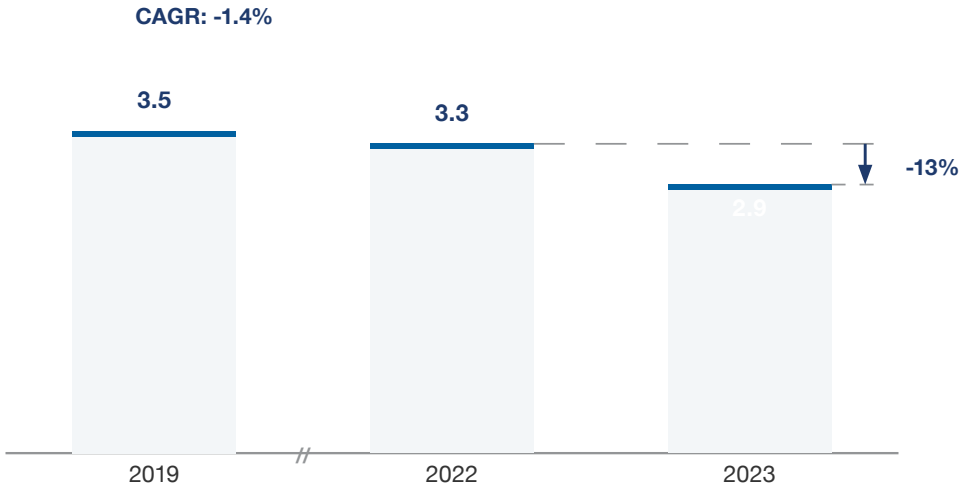
Overall, the **price of procured insulin decreased by 13-19%**, with a similar impact also for the branded products which were purchased previously >>

It must be noted that **purchased volumes significantly increased** between 2022 and 2023, with a +26% for human insulin and +162% for analogues insulin >>

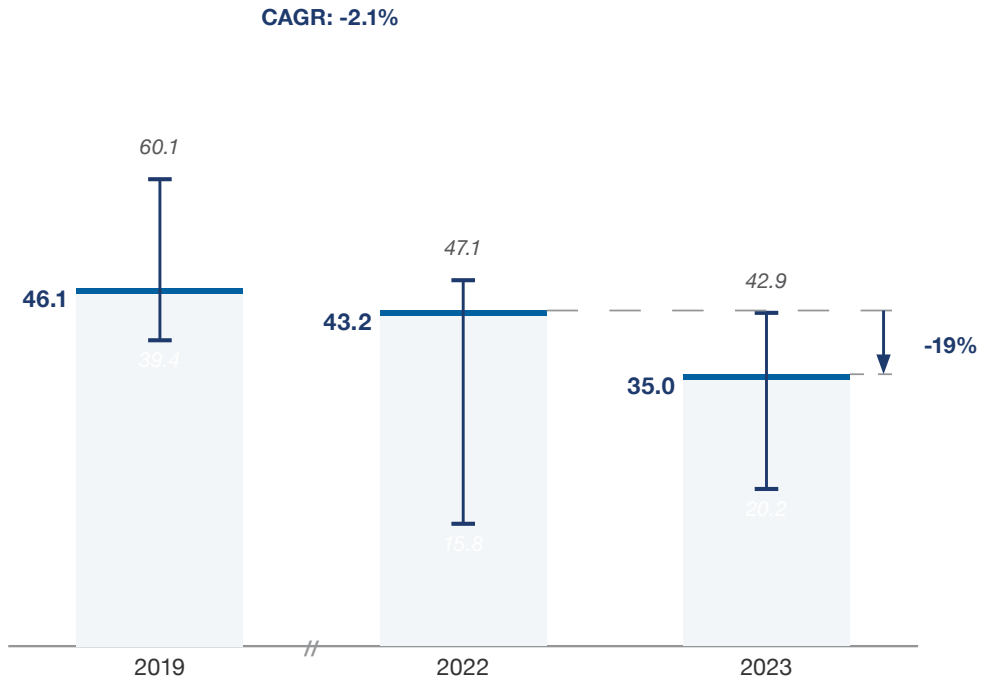
SOURCE: In-line with text; Team analysis

… and this change led to price reductions in insulin procurement between 13-19% in 2023 alone

Human Insulin procured price in Kyrgyzstan, USD/VIAL (10 mL) >>



Analogue[1] insulin procured price in Kyrgyzstan, USD/pack[2] (weighted average) (15 mL in Total) >>



1. All purchased analogue types are included (and they're price weighted with purchased volumes): Aspart Detemir, NPH, Glargine, Glulisine, Mixed
2. One Pack includes 5x cartridges of 3 mL for Pens

SOURCE: Government procurement of insulin, case studies in 11 LMICs >>

The holistic Base of Pyramid (BoP) PPP initiative from Novo Nordisk managed to significantly improve the stability and affordability of insulin supply, with limited impact on other dimensions of care

About Novo Nordisk PPP BoP program in Kenya

The Base of the Pyramid (BoP) project is a public–private partnership (PPP) initiated by Novo Nordisk that aims to facilitate access to diabetes care for people at the base of the economic pyramid in low- and middle-income countries (LMICs).

The role Novo Nordisk played was overall program coordination and convening, in Supply Chain (committing to a price ceiling of 500 KSH (about 5 USD) per vial and minimizing stock-outs), and funding capability building for healthcare working in diabetes centers of excellence

In Kenya, the BoP was implemented in 28 of 47 counties, along the 5 pillars of diabetes care:

Evaluated impact across program's pillars

Awareness: **limited impact**. Limited communication campaigns were performed

Early diagnosis: **limited impact**. At the beginning, when funding was available, patients were offered a free finger stick blood glucose testing with a glucose meter along with education and free tea, which successfully attracted patients. When funding ended, the costs of screening were passed to the patients, with a significant drop in interest and uptake

Access to quality care: **partial impact**. Training of healthcare workers was offered, together with supporting printed material. Training was perceived to be too limited, offered only to 1-2 persons per facility and hosted in central locations. The supporting printed material was welcomed and distributed further through informal networks

Stable and affordable insulin supply: **significant impact**. The supply of insulin remained more stable in terms of price and availability compared to other areas not covered by the program. Compared to other areas not covered by the program but with access to subsidies where insulin could be purchased with a price as low as 2 USD, frequent stock-outs forced patients to purchase in the private sector, leading to significant higher prices in practice

Improved self-management: **limited impact**. Patients support groups were established at the clinics, but they ran on limited resources, and it required people to take time off to join those sessions, plus the price of consumables for diabetes care were seen as additive out-of-reach expenses by many

SOURCE: Innovating to increase access to diabetes care in Kenya: an evaluation of Novo Nordisk's base of the pyramid project >>

The Union

International Union Against Tuberculosis and Lung Disease

05

ACCESS TO INHALED MEDICINES

Background and current state

Background and current state
Global and cross-country challenges
Country-specific challenges
Selected initiatives



Asthma and COPD impose a large burden on LMICs; access to inhaled corticosteroids and bronchodilators is essential to prevent exacerbations and premature deaths (1/2)

Conditions

- Asthma is a condition that causes airways to narrow. This makes it hard to breathe and cause other symptoms, like chest tightness, cough and wheezing. Common asthma triggers include allergies (like pets or pollen), smoke, cold weather, exercise, strong smells and stress. Some asthma attacks can be fatal, if not treated >>
- Chronic obstructive pulmonary disease (COPD) is a term for certain types of irreversible lung and airway damage that blocks (obstructs) the airways, leads to destruction of lung tissue (emphysema) and leads to excessive production of mucus (chronic bronchitis), making it hard to breathe. Commonly associated with smoking, household air pollution or occupational exposures, as well as poor lung development in childhood and previous infections with TB and HIV >> ; >>
- **Burden in LMICs:** Asthma and COPD cause a disproportionate share of global respiratory morbidity and mortality in LMICs, where approximately 96% of asthma-related deaths and 84% of COPD-related deaths occur >> ; >>

Diagnosis

- Asthma is diagnosed by confirming both a history of variable respiratory symptoms, such as wheeze, shortness of breath, chest tightness and cough, which vary over time, intensity, triggers or occurrence at night, and objective evidence of variable expiratory airflow limitation. This is **preferably demonstrated by spirometry**, with an increase in FEV_1 of >200 mL and >12% after bronchodilator administration in adults, or by excessive peak expiratory flow variability or improvement in lung function after anti-inflammatory treatment >>
- COPD should be suspected in individuals with dyspnea, chronic cough, sputum production, or a history of exposure to risk factors such as tobacco smoke, biomass fuel, or occupational dust. The diagnosis is **confirmed by spirometry**, with a persistent post-bronchodilator FEV_1/FVC ratio <0.7 required to demonstrate persistent airflow limitation[1]. >>
- **Treatment pathways:** Asthma treatment follows a stepwise approach based on symptom control and exacerbation risk >>
- Track 1 (preferred): low-dose ICS-formoterol used both as maintenance and as-needed reliever (called Maintenance And Reliever Therapy or Anti-Inflammatory Reliever therapy), starting from Step 1 for mild asthma up through Step 4/5 by increasing the dose, adding a LAMA, or referring for severe asthma phenotyping and biologics
- Track 2 (alternative, used where ICS-formoterol isn't available): regular ICS-based maintenance (low to high dose, with LABA added at higher steps) plus an as-needed SABA or ICS-SABA reliever
- Step 5, for severe asthma, includes add-on LAMA, biologics (targeting eosinophilic/allergic phenotypes), or as a last resort, maintenance oral corticosteroids

1. While pre-bronchodilator spirometry can help rule out COPD, post-bronchodilator testing is necessary to confirm the diagnosis, as pre-bronchodilator measurements may over diagnose COPD in some individuals with reversible airflow obstruction

SOURCE: In-line with text; Team analysis; additional details and sources on dedicated pages

Asthma and COPD impose a large burden on LMICs; access to inhaled corticosteroids and bronchodilators is essential to prevent exacerbations and premature deaths (2/2)

Treatment pathways (Cont'd):

- Initial COPD treatment is guided by the ABE assessment, which considers symptom burden and exacerbation history rather than lung function alone. >>
  - Group A patients (low symptoms and low exacerbation risk) are treated with a short- or long-acting bronchodilator as needed.
  - Group B patients (higher symptom burden and low exacerbation risk) are recommended LABA+LAMA dual bronchodilator therapy as the preferred initial treatment.
  - Group E patients (high exacerbation risk regardless of symptoms) should receive LABA+LAMA from the outset, with the addition of an inhaled corticosteroid (ICS) as triple therapy
- Follow-up inhaled COPD treatment relies on stepping up to LABA+LAMA dual bronchodilator or triple therapy depending on the symptom burden

Global guidelines and relevance for LMICs

- GINA (Global Initiative for Asthma): Provides global updates on asthma assessment and step-wise management, prioritizing low-dose ICS-formoterol to mitigate asthma death risk >>
- GOLD (Global Initiative for Chronic Obstructive Lung Disease): Establishes evidence-based strategies for COPD screening, maintenance, exacerbation management, and biologic therapies >>
- WHO PEN: Provides cost-effective primary-care protocols for asthma and COPD in low-resource settings >>
- WHO PEN-Plus: Targets first-level referral facilities (district hospitals) in LMICs, did not included asthma and COPD. However, some countries in Africa are also including improved care for severe chronic respiratory diseases, including childhood asthma, and advanced COPD >>



SOURCE: In-line with text; Team analysis; additional details and sources on dedicated pages

Key players for inhaled medicines (ICS/LABA/LAMA): Large branded players dominate but with lower presence in LMICs compared to insulin; presence of generics offers promise

TYPE	BUSINESS FOCUS IN HICS	LMIC FOCUS	COMPANIES	RELEVANT PRODUCTS (COMPOUND NAME) – ICS/LABA/LAMA (NOT EXHAUSTIVE)
Originators / branded	• Focus on combination maintenance therapies • Strategic shift toward targeted biologics (e.g., Nucala, Fasenra, Xolair) for severe asthma and type-2 driven COPD • High focus on HICs	• Some presence in larger LMICs • Unlike for insulin, limited donation projects and limited engagement	GSK	• Trelegy Ellipta (fluticasone furoate / umeclidinium / vilanterol) – ICS/LAMA/LABA >> ; >> • Relvar / Breo Ellipta (fluticasone furoate / vilanterol) – ICS/LABA >> ; >> • Seretide / Advair (fluticasone propionate / salmeterol) – ICS/LABA >> ; >>
			Astra Zeneca	• Symbicort pMDI (budesonide / formoterol) – ICS/LABA >> ; >> • Airsupra (budesonide / albuterol) – ICS/SABA >> ; >>
			Boehringer Ingelheim	• Spiolto / Stiolto Respimat (tiotropium / olodaterol) – LAMA/LABA >> ; >> • Striverdi Respimat (olodaterol) – LABA >> ; >> • Spiriva Respimat (tiotropium) – LAMA (Note: ICS/LABA is not part of product portfolio) >> ; >>
			Chiesi	• Foster (beclometasone dipropionate / formoterol) – ICS/LABA >> ; >> • Atimos (formoterol) – LABA >> ; >> • Trimbow (beclometasone dipropionate / formoterol / glycopyrronium) – ICS/LABA/LAMA >> ; >>

SOURCE: In-line with text; Team analysis

Key players for inhaled medicines (ICS/LABA/LAMA): Large branded players dominate but with lower presence in LMICs compared to insulin; presence of generics offers promise

TYPE	BUSINESS FOCUS IN HICS	LMIC FOCUS	COMPANIES	RELEVANT PRODUCTS (COMPOUND NAME) – ICS/LABA/LAMA (NOT EXHAUSTIVE)
Generics	• Developing generic equivalents of blockbuster ICS/LABA and LABA/LAMA combinations • Competing on cost-effective supply, government tenders, and institutional procurement programs. • Focus on HICs and home markets	• Currently limited presence outside larger LMICs or home LMIC	Cipla	• Foracort (budesonide / formoterol) – ICS/LABA >> ; >> • Budecort (budesonide) – ICS >> ; >> • Duova (formoterol / tiotropium) – LABA/LAMA >> ; >> • Foracort G (budesonide / formoterol / glycopyrronium) – ICS/LABA/LAMA >> ; >>
			Teva	• AirDuo RespiClick (fluticasone propionate / salmeterol) – ICS/LABA >> • AirDuo Digihaler (fluticasone propionate / salmeterol) – ICS/LABA >>
			Viatris	• Wixela Inhub (fluticasone propionate / salmeterol) – ICS/LABA >> ; >> • Breyna (fluticasone propionate / salmeterol) – ICS/LABA >> ; >>
			Lupin	• Budamate (budesonide / formoterol) – ICS/LABA >> ; >> • gSpiriva (tiotropium) – LAMA >> • Loftair (indacaterol / glycopyrronium) – LABA/LAMA >> ; >>

- **Primary Drug Patents:** The original patents covering the active medicinal molecules for ICS/LABA/LAMA have almost all expired >>
- **Secondary Device Patents:** Companies file dozens of extra patents strictly on device mechanics (dosing valves, fine-powder air channels, dose counters, and aerosol propellants) >>
- **Device Hopping:** GSK employed “device hopping” for inhalers such as Ventolin (MDI) and Arnuity Ellipta (DPI), launching follow-on devices with the same active ingredients to extend patent and regulatory exclusivity >>
- **Secondary Device Patents:** Companies file dozens of extra patents strictly on device mechanics across pMDIs, DPIs, and SMIs (dosing valves, fine-powder air channels, dose counters, and aerosol propellants). Empirical research published in PLOS ONE shows device patents extend market monopoly by a median of 4.7 years, and up to 15.2 extra years past the drug’s original expiration date >>

SOURCE: In-line with text; Team analysis

SRA-approved generics for key ICS+LABA exist; they could potentially be registered in multiple LMICs via WHO's Collaborative Registration Procedure

SRA approved Generics for key ICS+LABAs exist	• **Budesonide + formoterol**
	  › AstraZeneca was originator, with Symbicort as the leading inhaler in this category
	  › Teva and Viatris have SRA approvals
	• **Fluticasone + salmeterol**
	  › GSK was originator
	  › Cipla, Mylan (Viatris), Hikma and several others have at least one SRA approval

WHO's Collaborative Registration Procedure could facilitate registration in LMICs	• **Purpose**: Accelerate national registration of quality-assured medicines and vaccines by leveraging existing trusted regulatory assessments. >> • **Eligibility**: Products may be eligible through either: WHO Prequalification, or Approval by a WHO-Listed Authority (WLA) (previously referred to as a Stringent Regulatory Authority, SRA), using the corresponding CRP pathway. >> • **Who participates**: ~69 National Regulatory Authorities (NRAs) (plus regional participation through CARICOM) currently participate in the medicines/vaccines CRP. >> • **Target timeline**: Participating NRAs are encouraged to reach a regulatory decision within 90 working days. >>

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

05

ACCESS TO INHALED MEDICINES

Global and cross-country challenges

Background and current state

Global and cross-country challenges

Country-specific challenges

Selected initiatives



Low political prioritization; service delivery poorly organized leading to very low diagnostic rates (in part due to impractical diagnostic) and sub-optimal treatment with stigma as a major challenge; overall neglect leads to ICS+LABA being available in small private markets only

KEY ISSUE	DRIVER	DETAILS
Financing and political prioritization at the country level largely missing	**n/a**	• Most LMICs have only recently started addressing NCDs guided by WHO's PEN package: within these the focus is on hypertension, diabetes and cardiovascular conditions. Due to changes in global health donor funding, even this progress is under threat in several countries >> ; >> ; (R13) • Although asthma and COPD are included in the PEN package, there is very limited attention to Asthma and COPD in most LMICs; this is evident in absent or poor governance structures at the central MoH levels. Poor attention and governance translates to limited budgeting. (R9, R13)
Low diagnosis rates and where diagnosed, sub-optimal or expensive treatments	**Service delivery is poorly organized, and largely absent in primary care**	• 1 Absence of prioritization leads **to weak integration into primary care and chronic-care systems**; Specialist dominance blocks task-shifting — guidelines written by specialists are impractical for PHC, ICS is often prescribable only by specialists and **care is at higher levels**. >> ; >> ; >> ; (R7) • As a result, care is largely generalized in primary care as **most staff are not equipped to diagnose and prescribe** beyond relief medication. As expected, in such a scenario: – **Diagnosis rates for asthma and COPD are very low** (Asthma slightly better due to higher index of suspicion but often confused with pneumonia). Spirometry, the gold standard for diagnosis is impractical in LMICs (R4) – **Treatment is focused on sub-optimal symptom relief** (long-term use of reliever therapies, SABA) or **emergency care in case of exacerbation.** Moreover, PEN guidance is currently out of step with the evidence base for asthma and COPD. Even where guidelines is appropriate, there is very high stigma around inhaled therapy and steroids (see next point). There is high out of pocket spending >> ; (R4)
	Awareness, stigma and provider confidence major barriers	• **Awareness and stigma major barriers to care seeking and adherence** —myths that inhalers are "addictive" or last-stage, and that "steroids are bad"; patients may hide inhaler use, even in marriage discussions. Patients face social embarrassment, family and peer pressure to hide the condition, that can also be a barrier for marriage prospects. Patients often delay treatment until symptoms become severe >> ; (R4)
	Small / inefficient private markets drive affordability challenges	• Pharma companies may register their products in larger LMICs, but most of their product is via small private markets (R2) • **Key medicines except SABA, if available, are largely in private markets**: Buying standard inhalers can consume between 2 to 7 days' wages. >>

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

1 Several challenges with spirometry make its deployment in LMICs (and even HICs) challenging high patient effort and operator training needed, safety and accuracy challenges

CHALLENGES	DESCRIPTION
High Patient Effort & Cooperation	• Spirometry requires the patient to take a maximum deep breath in and blast it out forcefully for at least 6 seconds >> • Young children (<5–6 years), elderly individuals, post-surgical patients, and adults with cognitive or neuromuscular impairments often cannot produce valid results >> ; >> • Poor effort leads to false positives for restriction or obstruction, forcing clinicians to discard up to 20–30% of primary care tests >>
Operator Training & Coaching Dependency	• Non-specialist primary care clinics frequently produce non-compliant flow-volume curves due to lack of coaching expertise. >> • Many clinicians feel apprehensive about purchasing a spirometer because of uncertainties about performing and interpreting spirometry >> • In one primary care study, 22% of spirometric maneuvers were not performed correctly >>
Safety Contraindications & Physical Risk	• Forced coughing and dramatic chest pressure spikes occur during the test. >> • Spirometry is unsafe for patients with recent thoracic/eye surgery, abdominal aneurysms, uncontrolled hypertension, or unstable cardiac conditions. >>
Low sensitivity for early/mild disease	• Traditional spirometric measures lack sensitivity to detect mild disease, partly because obstruction diagnosis relies on fixed values in the flow-volume curve that are insensitive to small airway disease, where COPD often begins. >>
Poor diagnostic accuracy for asthma specifically	• In a study of nearly 2,000 people, spirometry identified only 23% of people who actually had asthma, meaning it missed more than 3 out of every 4 asthma cases. While it correctly ruled out asthma in 90% of people who did not have the disease, its overall agreement with a clinician's diagnosis was very poor, highlighting its limited reliability as a standalone diagnostic test. >>

SOURCE: In-line with text; See subsequent detailed slides for sources

1 Potential alternatives to spirometry are emerging

POTENTIAL ALTERNATIVES	DESCRIPTION
Impulse Oscillometer	• Sends gentle sound wave pulses into the lungs while the patient breathes normally into a mouthpiece. Measures lung resistance and reactance >> • Performs during normal, passive tidal breathing. Ideal for young children, elderly, and frail patients and is available in the market >> ; >> • It is commercially available for use in hospital settings >>
N-Tidal Diagnose (AI diagnostic technology)	• Uses a fast-response sensor to record high-resolution breath waveforms during 75 seconds of normal relaxed breathing, analyzed by machine learning algorithms >> ; >> • Replaces 30-minute forced exhalation tests with a 75-second tidal breathing test and provides COPD likelihood and severity output in under 5 minutes without needing specialist interpretation >> • It became the first non-spirometry AI diagnostic device to receive a CE mark under the EU Medical Device Regulation Class IIa for COPD diagnosis in March 2025, and was launched within the UK National Health Service in September 2025 >>
Multiple Breath Washout	• Patient breathes pure oxygen to wash out inert nitrogen gas from the lungs over a few minutes. Calculates the Lung Clearance Index (LCI) >> • Highly sensitive to early air-trapping and ventilation heterogeneity in early COPD and pediatric asthma >> • Commercial devices like EXHALYZER D exist which can be used for detection and monitoring of asthma, cystic fibrosis and COPD >>
Electronic Noses (eNose) and Exhaled VOCs	• Sensor arrays or gas chromatography analyze chemical patterns of exhaled breath gases >> • Instantly distinguishes eosinophilic asthma from neutrophilic COPD and detects bacterial vs. viral flare-up markers prior to symptom onset >> • The technology is primarily used for clinical trials, research studies and is not yet available in routine clinical use. Breathomix is among the companies developing this technology >>

SOURCE: In-line with text; See subsequent detailed slides for sources

The Union

International Union Against Tuberculosis and Lung Disease

05

ACCESS TO INHALED MEDICINES

Country-specific challenges

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Global and cross-country challenges

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KENYA

Key challenges to inhalers' access in Kenya: Systemic underfunding, lack of focus leads to low capabilities, equipment, and medicines esp. at primary level; social stigma compounds challenges

Cross-cutting factors

- **Systemic Underfunding & Catastrophic Out-of-Pocket Costs**: While TB programs receive heavy national and donor funding, there is no dedicated national budget line for chronic respiratory diseases. >>
- **Pervasive Social Stigma & Treatment Misconceptions**: In many communities, patients attribute chronic respiratory symptoms to supernatural curses or witchcraft rather than medical conditions. Strong social stigma forces patients to hide their illness, refuse visible inhalers and spacers in public to avoid isolation, and express a strong preference for ineffective oral syrups over life-saving inhaled therapies. >> ; >> ; >>

Low screening and poor diagnosis rates

- Frontline screening is heavily skewed toward TB, meaning alternative respiratory diagnoses are routinely missed or mistreated as TB or bacterial infections. >> ; >>
- Near-total lack of basic diagnostic equipment (only 10% of facilities nationwide have functional spirometers) >>

Treatment gaps

- **Critical specialist deficit**, with fewer than 35 pulmonologists serving the entire country >>
- **Stockouts**: Public facilities, especially in rural areas, suffer from chronic inhaler stockouts, with essential inhaled corticosteroids (ICS) available in fewer than 20% of clinics. >>
- **Inappropriate Prescribing**: Furthermore, due to poor training on lung health guidelines, primary providers frequently suffer from a "fear of inhaler dependency", leading them to dangerously over-prescribe short-acting rescue inhalers (SABAs) or rely on oral steroids. >> (KII)
- **Out of pocket spending:** A large proportion of Kenyans lack health insurance coverage, forcing patients to pay out-of-pocket for expensive medications and imaging. This creates severe economic distress, driving families to deplete their savings, default on care, or even face intense family rejection and spousal abandonment. >> A budesonide-formoterol canister costs about 1,500–2,000 KES, which is too expensive for many households. (KII)

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

Key challenges to inhalers' access in Kyrgyzstan: Low govt. attention, and stigma as cross-cutting challenges; poor availability of ICS inhalers outside capital and high out of pocket payments due to high co-payments

Cross-cutting factors

- **Low government attention** (Higher focus on TB within lung health) >>
- Reliance on **traditional remedies**, particularly outside of Bishkek area; high use of antibiotics based on doctor prescription or patient's direct purchase without prescriptions >>
- **Stigma about asthma being a lifelong disability**; **fear of inhaler addiction** for children with asthma >> ; >>

Low screening and diagnosis rates

- **Poor health worker knowledge, especially at the primary level**. Low levels of training leaves a skill gap causing **under diagnosis or late diagnosis** (high number of severe COPD cases diagnosed); patients also have low awareness of Asthma and COPD and normalize symptoms. Inhaler technique is rarely taught by primary care providers; this support is mainly delivered by pulmonologists. >> ; >> ; (KII)
- **Centralized care creates further challenges:** Distrust of state-run public health care esp. at the primary level. Many go directly to private hospitals. Many patients bypass public facilities and pay full price at private pharmacies to avoid long travel distances. Long travel distances in more remote regions make seeking care challenging; a **systemic lack of equipment supplies like spirometers** prevents accurate staging and prescribing of inhaled medications (**diagnostics** mostly accessed in the private sector), leads to the high number of severe COPD cases; **lack of supply for inhaled (maintenance) medicines in public facilities** >> **;** >> ; >> ; (KII)

Among limited people diagnosed, major challenges in appropriate treatment and adherence

- ICS only available for sale in Bishkek area (only salbutamol and astalin were available all throughout Kyrgyzstan)- this results an incorrect use of SABA/ SAMA for maintenance; limited support in adherence due to high workloads of physicians (among limited people who were diagnosed >>
- **High costs of combination therapies** – in one study, over 70% of interviewed patients paid for own medication; unlike insulin which is free, **patients usually co-pay of 50% costs for COPD**: total annual per-patient cost of care was $331.5 (median: $103.5), comprising $107 in government-reimbursed services and **$224 in patient co-payments**. Overall, co-payments alone accounted for approximately **one-fifth of the annual income of patients with COPD** in Kyrgyzstan >> ; >>
- Over 80% of asthma and COPD patients in Kyrgyzstan exhibit poor adherence to their prescribed respiratory medications with a large part of non-adherence being intentional and patients stop treatment after 1–2 months when symptoms improve >> ; (KII)

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

Key challenges to inhalers' access in Peru: Low diagnosis for COPD; shortages of control therapies lead to poor adherence and/or private purchase and high out of pocket spending

Cross-cutting factors

- Unlike diabetes or TB, asthma and COPD lack a dedicated MoH focal point and formal national strategy (KII)
- No official COPD guidelines (current ones from respiratory society), limited patient advocacy (KII)
- High staff turnover undermines training and continuity of care (KII)

Low screening and diagnosis rates

- Up to 95% of COPD cases are estimated to go undiagnosed due to a lack of routine screening. Local primary health centers lack the trained staff to manage respiratory cases, and essential diagnostic tests like spirometry are strictly locked behind centralized, specialist-dependent hospital care. >> ; >> COPD and asthma are often underdiagnosed, and patients are usually treated only with rescue inhalers like salbutamol. (KII)

Among limited people diagnosed, major challenges in appropriate treatment and adherence

- **Critical Shortages of Preventive Controller Inhalers**: While quick-relief rescue inhalers (SABA like salbutamol) are generally accessible, essential daily preventive therapies (ICS, LABA, combinations) are severely lacking in public facilities. For example, one study quantified the availability of ICS to be only 33.7% for beclomethasone and 5.8% for fluticasone >> ; >>
- More **appropriate inhaled medicines**, including LAMAs and combination therapies, are largely limited to secondary care, while patient training on inhaler use is weak (KII)
- **High Private-Sector Costs & Pricing Disparities**: When stocks are not available in the public sector, patients must purchase inhalers out-of-pocket. A monthly supply of combination therapies requires more than 2 days' wages for a minimum-wage worker, with a comprehensive care costing families up to 500 soles or 147 USD per month), and prices spike even higher in rural private pharmacies. >> ; >>
- **System tracking** is deficient, leaving only 13% of pediatric asthma patients with a doctor who continuously monitors their disease. Families living in poverty experience high caregiver burden, frequently being forced to prioritize immediate survival (like food) over long-term treatments, while losing vital income to missed workdays during emergency clinic visits. >> ; >> ; >>

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

TANZANIA

Key challenges to inhalers' access in inhalers' access in Tanzania: Insufficient funding leads to limited diagnostic equipment and untrained providers; among few diagnosed, adherence poor due to stigma and limited medicines in public facilities

Cross-cutting factors

- Insufficient NCD budgets deprioritize CRDs >>
- <10% of facilities have CRD-trained staff >>
- Public perception is a major barrier because many people assume all respiratory illness = TB (KII)
- Acute asthma crises are easily recognized and treated with SABA, but the system is not organized for long-term asthma care (KII)
- There are no functional registries or tools to record, report, and follow chronic respiratory patients, so individual follow-up and population-level numbers are unknown (unlike TB/HIV)

Low screening and diagnosis rates

- Weak CRD screening at lower-level facilities leaves undiagnosed (including TB-negative patients); low disease awareness and stigma delay care-seeking. >> (also confirmed by KII)
- <2% facilities have spirometry >>

Among limited people diagnosed, major challenges in appropriate treatment and adherence

- 75% of clinicians lack correct inhaler technique >>
- Patients favor oral medicines amid family-driven misinformation and stigma >> ; >>
- Restrictive guidelines and uneven workforce limit supply—only 19% of facilities stock even inhaled salbutamol >> ; >>
- Patient adherence is low (≈60% non-adherent); clinic visits cause lost wages, income dictates inhaler choice >> ; >>
- Inhalers are often viewed as last-stage therapy, and patients stop treatment once they feel better (KII)

Note: These challenges are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

05

ACCESS TO INHALED MEDICINES

Selected initiatives

Background and current state
Global and cross-country challenges
Country-specific challenges
Selected initiatives



Selected initiatives for inhaled medicines: barring Brazil's case, most other initiatives were small and not many have succeeded

NAME	DESCRIPTION
Module 13 for Community Health Volunteers (Kenya)	• A training module for community health volunteers in Kenya by MoH to help them identify and manage asthma at the community level • Outcomes unclear, although low knowledge among healthcare workers suggest that it may not have been effective
Africa PUMUA Initiative (Kenya among others)	• AZ launched PUMUA in six countries in 2022, including Kenya, it targeted pediatric and adult care across public and private sectors through partnerships with governments • PUMUA has not yet published an independent evaluation demonstrating its impact on access to inhaled medicines, but it did not succeed as broader health systems strengthening did not take place (Team knowledge from interviews)
Novartis Access Project	• Novartis Access (2016-2018), a social business program that provides a basket of 15 noncommunicable disease (NCD) medicines to public and private nonprofit health organizations. Novartis supplied salbutamol inhalers for about US$1 per monthly treatment, but the lower price did not significantly improve patients' access to asthma medicines
FRESH AIR Project (Kyrgyzstan)	• Aimed at improving prevention, diagnosis, and treatment of chronic lung diseases in low-resource settings. Key interventions included cleaner cookstoves, smoking cessation (Very Brief Advice) via trained family physicians, digital spirometry training for providers, and pulmonary rehabilitation for COPD, asthma, and post-tuberculosis lung disease • Following the implementation of cleaner cookstoves, there was a reduction in respiratory symptoms among both adults and children, alongside a decrease in PM2.5 levels. (NOTE: Training and capacity building outcome is not available)
Asthma Drug Facility (Global)	• Asthma Drug Facility was established in 2005 to improve access to affordable, quality-assured inhalers through pooled procurement, prequalification, and competitive pricing • Resulted in significant price reduction of asthma medicines and inhalers, reaching more than 50% reduction of annual costs per patient with severe asthma in some countries • The program was ultimately discontinued in 2013, driven by low uptake, political commitment, and a lack of robust chronic respiratory disease management strategies at the national level and weak infrastructure at the global level
Brazilian National Medicines Access Program (Brazil)	• An initiative by the Brazilian Public Health System (SUS) launched in June 2011 to provide asthma medications (including beclomethasone, ipratropium bromide, and salbutamol) completely free of charge to patients through a network of 554 government-managed drugstores and 20,374 contracted private drugstores • Asthma hospitalization rates fell by 34%, from 90.09 per 100,000 (2008–2010) to 59.85 (2012–2014). Household asthma costs dropped from 29% to 2% of income. Access expanded significantly, with 513% more patients reached (from ~67,000 in 2012 to 344,000 in 2015)

Note: These initiatives are presented in greater detail in the annexures

SOURCE: See dedicated detailed slides for sources

Other inhaled medicines initiatives: Limited number of initiatives compared to insulin, mostly smaller research focused

NAME	DESCRIPTION
Kenya Integrated Program on Asthma, COPD and TB (iPACT)	An integrated lung health program led by Kenya's Ministry of Health with support from CHAI and funding from the Gates Foundation and GSK. Rather than screening for TB alone, iPACT trains health workers to screen, diagnose, and manage TB, asthma, and COPD through a single care pathway, using digital chest X-rays with AI-assisted reading to support diagnosis. Over one million people have been screened, identifying 14,823 TB cases alongside 4,476 cases of asthma, 1,278 of COPD, and 617 of lung fibrosis that would have gone undetected under a TB-only model >>
Test of Adherence to Inhalers Toolkit Study (Kyrgyzstan)	This observational study (2023) was conducted in both primary and tertiary care settings at the National Centre of Cardiology and Internal Medicine in Bishkek, Kyrgyzstan. The Test of Adherence to Inhalers (TAI) Toolkit was translated and adapted to fit the local context and was implemented in routine practice by nine physicians and three residents with a cohort of 100 COPD patients. The toolkit was specifically designed to address gaps in treatment adherence by providing individualized strategies to enhance adherence to inhaler therapy >>
Asthma Implementation Research (Peru)	The Asthma Implementation Research (AIRE) study (2019–2020) was a hybrid type 2 effectiveness-implementation individually randomized controlled trial in low-resource communities in Lima, Peru, evaluating a locally adapted intervention to improve asthma self-management in children. A total of 110 child–caregiver dyads were enrolled, with 101 completing follow-up (five losses: three control, two intervention). The intervention group received additional support from a nurse manager via monthly home visits and ongoing phone/text access over six months. Both groups received physician-prescribed inhaled corticosteroids free of charge >>
Breathe Well South America (Peru)	A 4-year research program (2024 onwards) funded by the NIHR (building on a £2 million Global Health Research Group) co-led with the Universidad Científica del Sur (UCSUR) in Peru. Starting in July 2024, it aims to assess primary care, develop a set of COPD quality indicators, and test the feasibility and cost-effectiveness of a new identification and treatment pathway for COPD patients >>

Note: These initiatives are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

Other inhaled medicines initiatives: Limited number of initiatives compared to insulin, mostly smaller research focused

NAME	DESCRIPTION
Global Excellence in COPD outcomes (Peru among others)	A pilot effectiveness-implementation randomized field trial (2018–2020) evaluated a one-year CHW-supported self-management intervention for individuals with COPD grades B–D in low-resource settings in Nepal, Peru, and Uganda. A total of 239 participants were randomized to the control (119) or intervention arm (120), including 40 from Peru (20 per arm). The control arm received basic COPD education from a CHW and free access to medications for acute exacerbations at designated clinics or pharmacies, with study teams ensuring consistent availability across sites >>
International Multi-disciplinary Programme to Address Lung Health and TB in Africa (IMPALA) (Tanzania)	An applied global health research program (2018) that sought to improve existing CRD diagnostic capacity and care by providing spirometry and peak flow meters to health facilities and starting new CRD clinics in the country. IMPALA was commissioned and funded by UK aid. IMPALA spans 11 partner countries in Africa >>
Improving Equity in Respiratory Disease Outcomes in Africa using Data-Driven Tools (Multiple African)	A 4-year global health research program (2024–2028) led by the University of Edinburgh, aiming to reduce deaths, disabilities, and broader health and societal impacts from respiratory diseases including COPD, asthma, tuberculosis, pneumonia, influenza and lung cancer across five African countries with high RD burden. The program brings together an interdisciplinary group of academics, policymakers, NGO representatives, patients, and civil society >>

Note: These initiatives are presented in greater detail in the annexures

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

06

Differences and similarities between insulin and inhalers

01 Executive summary
02 List of abbreviations
03 Objectives and scope of this report
04 The insulin access story
05 Access to inhaled medicines
06 Differences and similarities between insulin and inhalers
07 Applying the insulin lessons to inhaled medicines
08 Beyond insulin – Building access systems for chronic NCD care
09 Appendix



DIFFERENCES AND SIMILARITIES BETWEEN INSULIN AND INHALERS

Key similarities between diabetes (insulin), and asthma and COPD (inhaled medicines): Centralization, major availability/affordability challenges and provider fear of prescribing

Similarities

Complex administration: Unlike oral tablets, both require device proficiency, insulin needs correct injection technique, inhalers need correct inhalation coordination, with errors in either reducing effectiveness

Geographic centralization: Care and products' availability including diagnostics is concentrated in major cities. Patients in rural areas face long travel times or lack of local options. This is gradually changing for diabetes

Major affordability and availability challenge: Medicines are expensive, that limit the ability for government to provide them to the patients, and because of limited availability, patients have to revert to the more expensive private sector (but suppliers' concentration seems to be less impactful). Root causes are fragmented: the product is expensive per se, plus supply is concentrated, logistics is complicated, intermediaries charge for every step, etc.

Fear of prescribing: Healthcare workers often fear prescribing both insulin and inhalers, due to fear of over-prescribing (insulin), fear of steroids (inhalers) or fear of causing lifelong dependency (both), reflecting misconceptions that persist among providers



SOURCE: Team analysis

DIFFERENCES AND SIMILARITIES BETWEEN INSULIN AND INHALERS

Key differences between diabetes (insulin) and Asthma and COPD (inhaled medicines): Overall, challenges more acute for inhaled medicines, but a more favorable supply side offers promise

Differences that are favorable for inhaled medicines

No cold chain need: insulin is required to be kept refrigerated; inhalers do not

Generics have an easier path to registering LMICs for inhalers: Many generics have SRA registrations and can use WHO's Collaborative Registration Procedure to registering in multiple LMICs

No product divergence between HICs and LMICs : the attention of insulin suppliers is shifting to more expensive analogue insulin or new products (e.g., GLP1). The cheaper human insulin market, which is the most common product in LMICs is not attractive enough for new players. Barring triple therapy (ICS-LABA-LAMA combination) and advance biologics, treatment options are largely the same in LMICs and HICs

Opportunity for economies of scale: the originator for formoterol / budesonide (AstraZeneca) has significant manufacturing capacity, and they have dry power device that overcomes many of the issues with MDI/CFCs, and they have the capacity to deliver at very low cost

Differences that are unfavorable for inhaled medicines

Lower attention of donors, public health stakeholders, and LMIC governments: even if the health burden of COPD / asthma is higher than diabetes, diabetes has received a higher interest and level of funding than COPD / asthma. **Lack of patient groups** for effective advocacy

Much lower screening and diagnosis rates: Even though there are significant number of missed cases for diabetes, diagnoses rates are much lower, esp. for COPD

Diagnoses are more difficult: Spirometry is expensive and inconvenient

Clinical recommendations out of step: they are usually more up-to-date for diabetes than COPD / Asthma. Even WHO's PEN is out of step with evidence

Lower pharma interest and support to LMICs: big 3 have had extensive donation programs for insulin and reduced pricing strategies in LMICs, esp. for T1D which affects children. No comparable initiatives yet for inhaled medicines

Tactical treatment of symptoms leads to false hope: due to greater availability, simplicity and lack of knowledge, COPD / asthma patients are often prescribed SABA products (instead of ICS+LABA), that give short-term relief but do not help patients in the long term (in insulin that not applicable, glucose levels must be managed, regardless of how)

Much higher stigma: respiratory diseases can be seen as a "curse" patients prefer to hide from their family and community; using inhalers is often not socially acceptable, people have strong preference for more discrete but less effective tablets / syrups or traditional remedies

Limited inhalers knowledge: using inhalers properly is often seen as a challenge, and the healthcare workers which are supposed to teach patients often struggle themselves

Lower evidence availability: the research and evidence about diabetes and insulin access is much richer than for COPD / Asthma patients



SOURCE: Team analysis

The Union
International Union Against Tuberculosis and Lung Disease

07

APPLYING THE INSULIN LESSONS TO INHALED MEDICINES

General system-level recommendations

General system-level recommendations
Specific recommendations



Our preliminary recommendations for the field (1/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Drive greater global attention towards and COPD via targeted advocacy	1 **Keep the spotlight on WHA and UN political resolutions and declarations to bring greater attention and resources to problem**	• Support also the ongoing effort towards WHA resolution on Access to NCD Medicines for Children to ensure focus on asthma inhalers • Support the NCD Alliance to take on advocacy campaigns for asthma and COPD, including tracking government commitment to addressing these diseases/conditions • Support The Union, FIRS, ERS, GOLD and GINA to champion the need for more attention to asthma and COPD
	2 **Drive greater attention to field by strategically piggybacking on topics that already have traction**	• UHC movement (high level-UN meeting 2027) • PEN and PEN Plus have momentum • TB -> Lung health integration (lung health unique for NCD and infectious integration) • Environmental/Clean Air agenda and climate change/health
	3 **Support formation and engagement of patient advocacy groups**	• Strong voice of patients is needed, similar to diabetes • Global, regional, and national respiratory societies could support (e.g., as part of FIRS or of the NCD Alliance). Leverage groups like NCD Alliance and MSF in advocacy and community engagement
Update relevant global guidelines to align with latest science	4 **Provide technical assistance to support countries to align their guidelines to the latest versions**	• The GOLD (for COPD >>) and GINA (for asthma >>) reports include the latest international standards used by healthcare providers to diagnose, manage, and treat chronic obstructive lung diseases • The WHO PEN package is the operational vehicle by which most LMIC primary-care systems implement NCD management; it currently does not include the latest guidelines aligned with the latest evidence base, but an updated version should be released in 2026/2027 • Country support to align to latest guidelines, tapping on all relevant sources

SOURCE: In-line with text; Team analysis

Our preliminary recommendations for the field (2/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**5 Holistic country implementation work in selected LMICs to prove the case that demand exists and can be served**	• Need to address demand and supply together (taking together all relevant stakeholders including suppliers) • Major effort needs to de-stigmatize inhalers and steroid use with populations and with healthcare providers • Prioritize asthma at the primary-care level, where diagnosis and ongoing management can often be delivered using clinical assessment and simple tools such as peak-flow meters. A pathway for referral to secondary care for people who do not improve with first line therapy delivered in primary care should also be clearly defined • Train primary care workers to think of COPD as a cause of cough and breathlessness that should be differentiated from TB and heart failure, and establish pathways for treatment • Select a mix of countries where program would be under Primary care[1] MoH dept and others where TB programming is being widened (Global Fund and other resources may be available for these); most importantly pick countries which are ready, e.g., multiple products already registered
Provide opportunistic TA support in non-demonstration countries	**6 Provide opportunistic support by piggybacking on other adjacent efforts**	• Opportunistic support could include governance, financing and operational advice for inclusion of Asthma and COPD in ongoing efforts (e.g., lung health integration for TB – push by Global Fund, PEN-Plus expansion) • As part of broader NCD / UHC expansion, ensure that asthma and COPD find a “home” at the highest level of governance at MoH (either within TB expansion -> lung health OR with NCD departments) • Advocate for inclusion in UHC package and budget lines for Asthma and COPD • Support countries to improve diagnoses and prescriptions at least at secondary, tertiary levels (primary is hard work and may happen later once demonstrations present compelling evidence)

1. Even if asthma and COPD are NCDs, most patients show up with respiratory symptoms at primary care / emergency centers, not to NCD clinics

SOURCE: In-line with text; Team analysis

Our preliminary recommendations for the field (3/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Address selected supply-side challenges globally	7 **Increase in-country competition by supporting firms esp. generics with WHO's CRP procedure to register in more LMICs**	• Note: many of the generic ICS+LABA products are already registered with some SRAs
	8 **Support LMIC NRAs with capacity building for inhaled medicines**	• There are currently no standard ways of showing that generic inhalers have the same effectiveness as originators
	9 **Negotiate with pharma companies more affordable prices in LMICs**	• Experience from insulin shows direct price negotiations with pharma companies proved more effective than tenders to reduce purchase price • Options to be explored include: tiered pricing, volumes guarantees, long-term agreements (e.g., like Medicines Patent Pool, UNICEF, CHAI), demand consolidation through global or regional platforms (e.g., like the TB Drug Facility, UNICEF, PAHO Strategic Fund)
Develop knowledge products	10 **Develop knowledge products to help better articulate challenges, potentially in collaboration with the WHO**	• State of inhaled medicines market covering key market developments (released at a pre-defined frequency)[1] • End-to-end analysis of access to care for asthma / COPD patients, including access to inhalers, but extending also to diagnostics, referrals, etc.

1. This could include: Status of registration of key medicines in LMIC; Capability landscaping of NRAs for assessing inhaled medicines; ACCISS-style studies around pricing and its determinants, supply chain and availability in LMICs: map the current value chains and introduce systems to increase their transparency (e.g., visibility on transfer prices, on stock levels at different steps of the value chain, on tariffs and taxes, etc.), leading to its streamlining (e.g., removing intermediaries, etc.). A source of inspiration for this can be the annual HIV Market Report produced by CHAI

SOURCE: In-line with text; Team analysis

Our preliminary recommendations for the field (4/4)

GROUP	RECOMMENDATIONS	DETAILS / EXAMPLES
Support R&D efforts	11 **Support innovators that try to improve current medications**	• Possible innovations currently explored by innovators include non-steroidal medicines, new delivery methods other than inhalers, etc. • Note: these are unlikely to become available in the short-term
Support broader market shaping	12 **Support the development of pooled procurement efforts**	• Data generation could be the first step in supporting pooled procurement and long-term agreements for lower pricings • Support and actively engage in procurement across health areas including TB (e.g., APPM, TDF, UNICEF, Global Fund) • Develop technical assistance modules to support governments in integration of treatment for asthma and COPD across other disease areas including TB and in primary care clinics • Look for inspiration from other experiences such as Africa CDC, African Pooled Procurement Mechanism (APPM), TB Drug Facility

Note: While limited diagnosis was identified as a major challenge, the focus of this report was access to inhaled medicines, so no specific recommendations about diagnosis were included.

SOURCE: In-line with text; Team analysis

EXECUTIVE SUMMARY

Recommendations rated on potential impact along likely timelines (indicative)

HIGH IMPACT

MID IMPACT

1 Keep the spotlight on WHA and UN political resolutions and declarations to bring greater attention and resources to problem

4 Provide technical assistance to support countries to align their guidelines to the latest versions

5 Holistic country implementation work in selected LMICs to prove the case that demand exists and can be served

9 Negotiate with pharma companies more affordable prices in LMICs

3 Support formation and engagement of patient advocacy groups

12 Support the development of pooled procurement efforts

2 Drive greater attention to field by strategically piggybacking on topics that already have traction

6 Provide opportunistic support by piggybacking on other adjacent efforts

7 Increase in-country competition by supporting firms esp. generics with WHO's CRP procedure to register in more LMICs

8 Support LMIC NRAs with capacity building for inhaled medicines

10 Develop knowledge products to help better articulate challenge, potentially in collaboration with the WHO

11 Support innovators that try to improve current medications

SOURCE: Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

07

APPLYING THE INSULIN LESSONS TO INHALED MEDICINES

Specific recommendations

General system-level recommendations

Specific recommendations



SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #1 - for national governments of target countries (1/3)

Role & Focus: National health ministries and treasury departments hold the ultimate responsibility for public health funding, standard treatment guidelines, universal health coverage benefits, and national pharmaceutical regulations

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Drive greater global attention towards asthma and COPD via targeted advocacy	**Establish clear governance and financing structures for asthma and COPD**	• Clearly identify specific team under the Ministry of Health that will be accountable asthma and COPD programming. Build in annual review mechanisms to track progress • Include asthma and COPD in UHC or other relevant budgets. Key medicines should be included in reimbursement packages
	Conduct campaigns (mass, mid-media) on asthma and COPD	• The Ministry of Health can launch a national respiratory advocacy campaign with local patient groups, focusing on all the fears and stigma associated with the disease itself and with the usage of inhalers in public
	Support formation and engagement of patient advocacy groups	• Support the creation and fund the sustainability of patients groups where their voice can be heard and their suggestions considered, for implementation by the public health system or local NGOs • Global, regional, and national respiratory societies could support (e.g., as part of FIRS or of the NCD Alliance). Leverage groups like NCD Alliance and MSF in advocacy and community engagement
Update relevant global guidelines to align with latest science	**Update national Standard Treatment Guidelines and the national Essential Medicines List to incorporate the latest guidelines**	• The Ministry of Health should update their national Standard Treatment Guidelines and Essential Medicines List to include the latest guidelines, referring to WHO guidelines and the GOLD (for COPD >>) and GINA (for asthma >>) reports • A public health perspective should be incorporated that allows treatment to be available more widely rather than in a limited number of tertiary facilities
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**Roll out service delivery at primary levels and above by integrating with existing relevant programs where possible**	• Identify relevant national programs already operating at scale. In many cases, this may be the TB program broadening into wider lung health issues. In other cases, teams with the NCDs department may provide the right home for asthma and COPD.

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #1 - for national governments of target countries (2/3)

Role & Focus: National health ministries and treasury departments hold the ultimate responsibility for public health funding, standard treatment guidelines, universal health coverage benefits, and national pharmaceutical regulations

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Demonstrate value of inhaled medicines in a limited set of high-readiness countries (cont'ed)	**Roll out service delivery at primary levels and above by integrating with existing relevant programs where possible** (cont'ed)	• For these programs, synergies where minimal marginal effort can bring significant benefits, e.g., increase the scope of screening from another disease to include asthma and COPD, leverage existing supply chain networks to include inhalers, extend existing awareness/communication channels to include other topics like how to use inhalers or to address the stigma associated to their usage • Invest in capacity building of staff, including at the primary care level (include in ongoing curriculum of doctors, nurses and allied professionals) • Investigate collaborations with the private sector and local organizations to define holistic programs focusing on the improvement of access to care for COPD and asthma patients, which considers the whole care journey • Potentially join multinational demonstration programs
Provide opportu-nistic TA support in non-demonstra-tion countries	**N/A**	• N/A
Address select supply-side challenges globally	**Ensure the NRA has the capacity to approve local inhalers' production**	• Improve capabilities of the NRA to build the necessary knowledge and capacity to assess and approve inhaled medicines. If required, seek out support from WHO and global actors
	Encourage competition between multiple suppliers	• Countries may actively engage with suppliers to register their products in country in order to not have dependence on a single vendor or a limited set of vendors
	Set up national procurement team to negotiate with inhalers' suppliers	• Set up a national procurement team to proactively reach out to inhalers' manufacturers and suppliers, to be able to negotiate a cheaper and more reliable supply of inhalers • Where appropriate and available, explore regional procurement to improve availability and affordability (see last point)

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #1 - for national governments of target countries (3/3)

Role & Focus: National health ministries and treasury departments hold the ultimate responsibility for public health funding, standard treatment guidelines, universal health coverage benefits, and national pharmaceutical regulations

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Address select supply-side challenges globally (cont'ed)	**Rationalize tariffs**	• Where appropriate, rationalize tariffs to reduce end-user prices
Develop knowledge products	**Conduct baseline assessment studies**	• Commission a national CRD baseline survey (chronic respiratory disease) that covers availability, affordability, OOP burden, stockout patterns and publish results • This can follow the WHO–HAI/ACCISS methodology
Support R&D efforts	**N/A**	• N/A
Support broader market shaping	**Support the development of regional pooled procurement efforts**	• For the engagement of private suppliers, investigate the option to join forces with other countries in the same region, to pool procurement efforts in purchasing inhalers

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #2 - for regional bodies (1/2)

Role & Focus: Regional bodies (such as Africa CDC, PAHO, or regional economic blocks) are vital for coordinating multi-country regulatory harmonization, organizing regional pooled procurement, conducting cross-border market surveillance, and facilitating peer-to-peer knowledge sharing among member states

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Drive greater global attention towards asthma and COPD via targeted advocacy	**Advocate with country governments for greater attention including financing for asthma and COPD; provide TA if appropriate**	• Bring asthma and COPD to the agenda in discussions around lung health and NCDs more broadly • Support governments with operationalizing programs on asthma and COPD
Update relevant global guidelines to align with latest science	**N/A**	• N/A
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**Drive multi-country pilot networks to share cross-border operational learnings and establish peer-review channels**	• Coordinate activities among countries within the same region, looking for operational synergies, identifying best practices and learning from failures
Provide opportunistic TA support in non-demonstration countries	**N/A**	• N/A
Address select supply-side challenges globally	**Support cross-region registrations of products**	• If appropriate, facilitate registration of relevant products in region

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #2 - for regional bodies (2/2)

Role & Focus: Regional bodies (such as Africa CDC, PAHO, or regional economic blocks) are vital for coordinating multi-country regulatory harmonization, organizing regional pooled procurement, conducting cross-border market surveillance, and facilitating peer-to-peer knowledge sharing among member states

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Develop knowledge products	**Fund knowledge products about regional challenges and possible solutions**	• Fund the development of region-specific knowledge products that investigate and formalize considerations about access to inhalers • In particular, to assess the current situation, make sure the following topics are included: access to diagnostics, pricing transparency, supply chain structure and inefficiencies • Regarding possible solutions, make sure outcomes of local initiatives and pilots are included, to be able to learn from successes and failures • Identify indicators to monitor progress, publish a yearly report, measuring those indicators
Support R&D efforts	**N/A**	• N/A
Support broader market shaping	**Set up a regional pooled procurement effort for inhaled medicines, or integrate within existing mechanisms**	• For the engagement of private suppliers, coordinate activities of countries in the same region, to pool procurement efforts in purchasing inhalers • Look for inspiration from other experiences such as Africa CDC, African Pooled Procurement Mechanism (APPM), TB Drug Facility

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #3 - for global health agencies and donors (1/2)

Role & Focus: Global health agencies, bilateral donors, and international NGOs (such as WHO, Global Fund, UNICEF, CHAI, and Unitaid) provide global policy guidelines, catalytic funding, technical assistance, market-shaping negotiations, and quality prequalification of generic inhaled drug-device combinations

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Drive greater global attention towards asthma and COPD via targeted advocacy	**Support and fund NGOs to increase attention to asthma and COPD**	• Support the NCD Alliance to take on advocacy campaigns for asthma and COPD, including tracking government commitment to addressing these diseases/conditions • Fund an advocacy fund to support organizations like The Union, FIRS, ERS to champion the need for more attention to asthma and COPD
Update relevant global guidelines to align with latest science	**Fund technical assistance for countries that want to embrace the latest guidelines**	• Provide funding for global, regional, and national dissemination of WHO guidelines and GOLD/GINA reports • Offer funding and technical assistance to those countries willing to include the latest guidelines into their own, adapting for the local needs
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**Offer catalytic grants financing to support comprehensive, end-to-end country demonstration pilots**	• Co-finance pilots to test the implementation of localized initiatives, prioritizing those that follow an end-to-end approach, considering the whole care journey of COPD and asthma patients and engage other key stakeholders actively • Fund the discovery of appropriate operational models
Provide opportunistic TA support in non-demonstration countries	**Fund technical assistance for countries willing to explore how to integrate care for COPD and asthma patients into their existing programs**	• Fund technical assistance for the Ministry of Health for the countries willing to explore synergies with any relevant existing programs (e.g., tuberculosis, lung cancer, environment/clean air, etc.), where a small marginal additional work might have a significant impact on COPD and asthma patients

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #3 - for global health agencies and donors (2/2)

Role & Focus: Global health agencies, bilateral donors, and international NGOs (such as WHO, Global Fund, UNICEF, CHAI, and Unitaid) provide global policy guidelines, catalytic funding, technical assistance, market-shaping negotiations, and quality prequalification of generic inhaled drug-device combinations

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Address select supply-side challenges globally	**Engage with possible generics manufacturers, to increase the offer of inhalers in the market**	• Proactively engage with generics manufacturers, new or already producing inhalers, to understand their interest in entering new markets or ramping up production in LMICs to serve other LMICs. If required, financially support them to enter more LMICs and avail WHO's CRP program
	Fund technical assistance for willing NRAs to be able to approve inhalers' manufacturers	• Offer the required support and funding for local willing NRAs to become able to approve local manufacturing of inhalers
Develop knowledge products	**Fund the development of knowledge products to help better articulate challenges**	• Fund the development of an end-to-end assessment of the challenges people with COPD and asthma to be diagnosed and access care, better if in collaboration with the WHO. Define key indicators to monitor progress • Update the report every 2 years, including an update of the above-mentioned indicators
Support R&D efforts	**Fund innovators that try to improve current medications**	• Fund innovators that try to identify new products to significantly improve the care of people with COPD and asthma • Note: this is a long-term high-risk domain, which might be of lower interest for the private sector. Donors can step in a co-fund some initiatives, thus de-risking or limiting the exposure of private capital
Support broader market shaping	**Fund the development of market efforts including pooled procurement**	• Options to explore, that might require funding, include: volumes guarantees, long-term agreements (e.g., like Medicines Patent Pool, UNICEF, CHAI), demand consolidation through global or regional platforms (e.g., like the TB Drug Facility, UNICEF, PAHO Strategic Fund) • Look for inspiration from other experiences such as Africa CDC, African Pooled Procurement Mechanism (APPM), TB Drug Facility

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #4 - for industry & private sector (1/2)

Role & Focus: Innovator and generic manufacturers, distributors, and device designers are critical supply-side stakeholders. To improve access, they can engage in tiered pricing, register quality-assured generics, and support independent patient advocacy. This would also have the potential to increase their overall profits, with a win-win for them and the patients

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Drive greater global attention towards asthma and COPD via targeted advocacy	**Support patient advocacy groups**	• Proactively support and engage with patient advocacy groups to elevate the salience of the diseases in country
	Conduct campaigns (mass, mid-media) on asthma and COPD	• Firms can launch a national respiratory advocacy campaign with local patient groups, focusing on all the fears and stigma associated with the disease itself and with the usage of inhalers in public
Update relevant global guidelines to align with latest science	**N/A**	• N/A
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**Partner with country implementation programs by guaranteeing a secure, low-cost supply of quality-assured products**	• Join implementation programs and help making them a success, providing supplies or guaranteeing a stable supply, when relevant • This can open new markets and satisfy new unmet patients' needs
Provide opportunistic TA support in non-demonstration countries	**N/A**	• N/A

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #4 - for industry & private sector (2/2)

Role & Focus: Innovator and generic manufacturers, distributors, and device designers are critical supply-side stakeholders. To improve access, they can engage in tiered pricing, register quality-assured generics, and support independent patient advocacy. This would also have the potential to increase their overall profits, with a win-win for them and the patients

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Address select supply-side challenges globally	**Leverage WHO's CRP program to register in multiple LMICs and leverage regional distributors to bring products to patients**	• WHO's CRP program allows SRA registered vendors to register in multiple LMICs through a single window procedure • Collaborate with regional distributors to make product available in-country
	Proactively engage with government procurement teams to explore win-win agreements	• Engage with government procurement teams to understand their needs and negotiate on all the relevant dimensions (price, supply reliability, long-term commitments, etc.), looking for win-win agreements
Develop knowl-edge products	**N/A**	• N/A
Support R&D efforts	**Develop LMIC-appropriate products**	• Drive the development of products and formulations that improve LMIC uptake
Support broader market shaping	**Explore options to increase access with global stakeholders**	• Proactively reach out to global stakeholders to explore co-development of market-shaping initiatives that can benefit patients, increase access, and also increase profits • Option includes: voluntary patent licensing (only for patented products) to cover geography with limited market potential, and tiered pricing, sales to donors-supported regional platforms, etc.
	Publish quality-assured, time-limited ceiling prices for key medicines	• Originator manufacturers should publish quality-assured, time-limited ceiling prices for one ICS+LABA and one LABA+LAMA combination in LMIC government tenders (this can be similar to ceiling price commitments by Novo Nordisk and others in the insulin space)
	Explore strategies to reduce costs for key products	• Evaluate and explore options to reduce the COGS of most relevant products, including via regional production

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #5 - for professional associations (1/2)

Role & Focus: Academic and clinical respiratory groups (such as The Union, FIRS, ERS, and national clinical networks) drive medical training, translate guidelines into clinical toolkits, conduct local audits, and provide expert advisory support to national regulators and pooled procurement agencies

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Drive greater global attention towards asthma and COPD via targeted advocacy	**Champion the lung health agenda advocate governments for NCD prioritization**	• Relevant organizations, including The Union, FIRS, and ERS can launch a coordinated advocacy campaign advocate the cause of patients with COPD and asthma, asking governments to increase their budget allocation
	Convene a CRD Patient Coalition	• Lead a global convening of patient representatives/bodies to create global pressure
Update relevant global guidelines to align with latest science	**Support national governments and national respiratory societies in updating guidelines**	• Provide technical support in updating guidelines based on country capabilities
Demonstrate value of inhaled medicines in a limited set of high-readiness countries	**Contribute to the design of program implementations in selected LMICs**	• Collaborate with implementers and funders to design implementation programs to improve access to inhalers in selected countries
Provide opportunistic TA support in non-demonstration countries	**N/A**	• N/A
Address select supply-side challenges globally	**N/A**	• N/A

SOURCE: In-line with text; Team analysis

SPECIFIC RECOMMENDATIONS FOR STAKEHOLDERS' TYPES

Specific recommendations #5 - for professional associations (2/2)

Role & Focus: Academic and clinical respiratory groups (such as The Union, FIRS, ERS, and national clinical networks) drive medical training, translate guidelines into clinical toolkits, conduct local audits, and provide expert advisory support to national regulators and pooled procurement agencies

GROUP	RECOMMENDATIONS	DETAILS/EXAMPLES
Develop knowledge products	**Conduct independent assessments of existing programs and quantitative bottleneck analyses of the chronic respiratory care pathway in LMICs**	• Develop knowledge to inform decision makers in the selection and prioritization of key improvement initiatives, in particular • For existing programs, offer to provide independent assessments of the execution and related impact of what was implemented • For selected countries, offer to analyze the end-to-end care journey of the patients, quantifying where the biggest losses happen, through primary research, when data are not readily available
	Develop state of asthma and COPD report every 2 years to provide the field and updated resource	• Publish the state of asthma and COPD report that covers burden as well progress along standard indicators • Update the report every 2 years, including an update of the above-mentioned indicators
Support R&D efforts	**N/A**	• N/A
Support broader market shaping	**N/A**	• N/A

SOURCE: In-line with text; Team analysis

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Beyond insulin – Building access systems for chronic NCD care

01 Executive summary
02 List of abbreviations
03 Objectives and scope of this report
04 The insulin access story
05 Access to inhaled medicines
06 Differences and similarities between insulin and inhalers
07 Applying the insulin lessons to inhaled medicines
08 Beyond insulin – Building access systems for chronic NCD care
09 Appendix



BEYOND INSULIN

Lessons from insulin and inhaled medicines can be applied more broadly to chronic NCD conditions in LMICs (1/2)

This report is built upon learning from the decades-long global experience with insulin access and applying those lessons to improve access to inhalers for asthma and COPD patients. While our previous analysis identified specific similarities and differences between these two areas, we found **these fundamental systemic insights are relevant for a broader spectrum of chronic NCDs**. Subject to further investigations, these lessons can establish a baseline for building resilient, equitable access pathways for NCDs in LMICs.

In examining the challenges patients face, **3 interconnected points stand out** as significant and are probably relevant for other chronic NCDs:

- **Low prioritization and underfunding**: barring a handful of conditions, NCDs suffer from low political visibility and domestic / international financing that is disproportionate to their high public health and economic burden (especially compared to diabetes patients). Governance mechanisms are also unclear in many LMICs, further diminishing accountability
- **Public service delivery not set up for identifying and treating diseases**: because of low prioritization, public health systems, especially at the primary level, are largely unequipped for addressing NCDs
- **Low uptake, inappropriate use, and stigma**: medications often have a low uptake or are incorrectly used. This is compounded by deep-seated social stigma, lack of disease awareness, and misconceptions about lifelong therapies, which deter patients from seeking timely diagnosis and adhering to treatments
- **The affordability and out-of-stock challenge**: public sector coverage of medicines is prone to out-of-stocks. This forces patients' families to pay high out-of-pocket costs at private pharmacies or go entirely without treatment



SOURCE: Team analysis

BEYOND INSULIN

Lessons from insulin and inhaled medicines can be applied more broadly to chronic NCD conditions in LMICs (2/2)

To address these challenges, the core **recommendations** discussed in previous sections of this report **could be generalized** across the wider chronic NCD landscape:

- **Aligning resources with burden**: the level of political attention and funding must be elevated to match the high burden of these diseases, through robust awareness and grassroots advocacy initiatives to mobilize change
- **Generating proof-of-concept via pilots**: evidence on "what works" for respiratory access in low-resource settings is currently limited; testing new, localized solutions would generate the vital, real-world evidence needed to guide national policies and programs operating at scale. This can help organization service delivery for chronic NCDs
- **Commitment to holistic approaches**: the limited available evidence shows that initiatives with a narrow scope also have a narrow impact. Holistic access models that are simultaneously addressing pricing, regulatory hurdles, healthcare worker capacity, and patient support systems are more likely to be successful

While the benefits of a holistic approach to address a patient's care journey for a specific disease are clear, we can ask a more ambitious question: **Why limit our impact to one disease at a time?** Rather than building separate, parallel tracks for individual conditions, why not establish a holistic NCD response that covers several chronic diseases at once. We could **unlock significant synergies across the entire cascade of care**. Training a healthcare worker on a unified clinical symptom pathway, utilizing shared diagnostic tools, and consolidating supply chains means that a single, integrated program can serve multiple needs. With this foundation, small, marginal additions to a newly designed program could yield significant, even life-changing benefits for patients with minimal extra effort, turning a series of fragmented grassroot initiatives into a single, powerful engine of health



SOURCE: Team analysis

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ANNEXURES



A healthier world for all, free of tuberculosis and lung disease

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APPENDIX

Methodology

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The scope of the project was articulated across the following deliverables

XX: milestone deliverable mentioned in the contract

PHASE	DELIVERABLES LIST AND DESCRIPTION [FORMAT] (DUE DATE)
1. Preparation	• **Kick-off** [PowerPoint] (by 5th June): including scope articulation and ways of working
2. Desk review	• **Report outline** [Word] (by 19th June): updated outline for the final report, including inputs from the Union team and findings from the desk review
3. Stakeholders consultations	• **Interviewees' list** [Excel] (by 26th June): list of preliminary stakeholders to be interviewed • **Interview guides** [Word] (by 26th June): list of preliminary questions, split by stakeholders' group, to support the interviews • **Interview summaries** [PowerPoint] (by 7th August): summary of all the findings emerged from the stakeholders' consultations • **Report from site visit to Kyrgyzstan** [PowerPoint] (by 7th August): summary of the main considerations emerged during the Kyrgyzstan visit
4. Finalize report	• **Final report draft** [PowerPoint] (by 7th August): draft of the full report, including inputs from the desk review, the stakeholders' consultations and the visit to Kyrgyzstan. Feedback expected within 3 weeks • **Final report** [PowerPoint] (by 2nd September): final version of the report, including all the feedback received to-date
Cross-phase	• **Team meeting presentations** [PowerPoint] *(at each meeting)*: summary of key findings from the last touch point; discussion of any project steer or attention points

SOURCE: Team analysis

Team set up, including roles and responsibilities, for the project

Consulting team (Alstonia Impact)

Main point of reference: Alessio Damato (Project co-lead & project management)

Additional team members (attending weekly meetings):

- Dhananjay (DJ) Vaidyanathan Rohini (Project co-lead & Expert)
- Samyukth Ramkumar (Associate, day-to-day execution)

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Main point of reference: Cassandra Kelly-Cirino (Project lead)

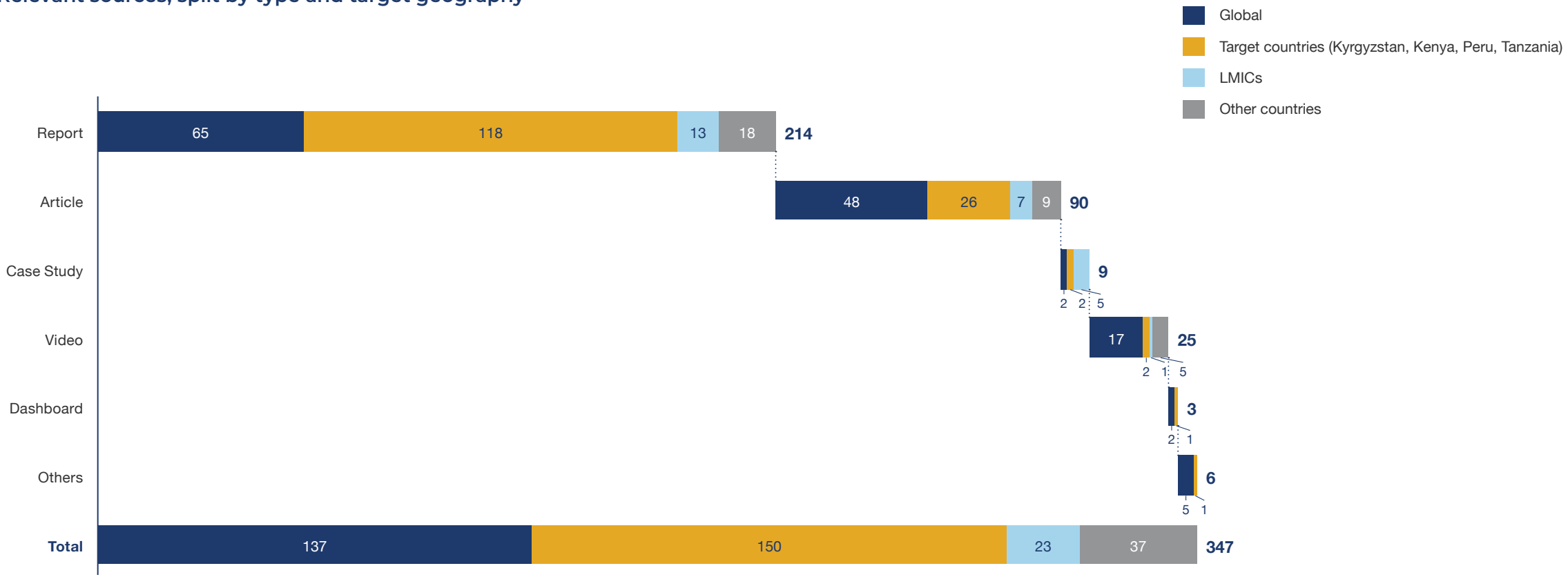
Additional team members (attending weekly meetings):

- Leith Greenslade (Every Breath Counts)
- David Halpin (FIRS, Expert Asthma and COPD)
- Guy Marks (President of The Union, Expert asthma and COPD)
- Marina Giachino (NCD Policy Lab, University of Geneve)
- *OPTIONAL:*
  - Sanhita Sinha (HR & Procurement head at The Union)
  - David Berhan (Tropical medical physician) – *Currently on leave*

SOURCE: Team analysis

Over 340 resources were consulted for our desk review

Relevant sources, spilt by type and target geography



SOURCE: file “Desk Review Files.xlsx”; Team analysis

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Framework definition

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FRAMEWORK

We needed a framework to structure the research and to make sure we do not miss any relevant dimensions. It was designed to have the following features

01

Simple to understand and self-explaining

02

Brief

03

MECE (mutually exclusive and collectively exhaustive)

04

Articulated across different levels, to be able to aggregate or deep dive easily (applying the “pyramid principle”), also to feed into the outline of the final report

SOURCE: Team analysis

FRAMEWORK

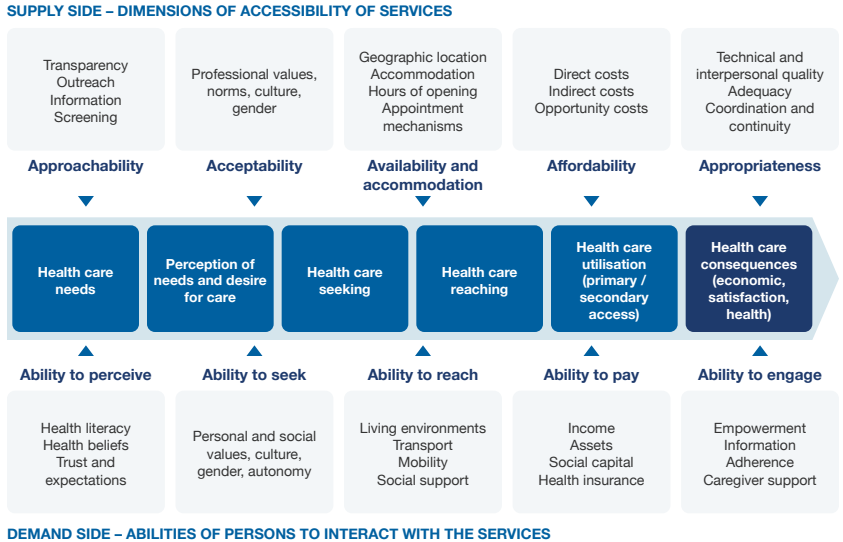
We investigated existing access frameworks for inspiration

6As access framework (1981, + 2016 update)

DIMENSION	DEFINITION AND EXAMPLES
Accessibility	**Location** Within reasonable proximity to the consumer in terms of time and distance
Availability	**Supply and demand** Sufficient services and resources to meet the volume and needs of the consumers and communities served
Acceptability	**Consumer perception** Responds to provider and consumer attitudes, e.g. service characteristics and social or cultural concerns
Affordability	**Financial and incidental costs** Direct costs for both the service provider and the consumer
Adequacy (Accommodation)	**Organization** Well organized to accept clients: hours of operation, referral or appointment systems, facility structures
Awareness[1]	**Communication and information** Effective communication and information with relevant users (clinicians, patients, community), considering context and health literacy

Five dimensions defined by Penchansky & Thomas (1981); [1] sixth dimension added by Saurman (2016)

Levesque model (2013)



A conceptual framework of access to health care (Levesque, Harris & Russell, 2013)

WHO medicines lifecycle (2018-2021)



Stages of the medicine life cycle (WHO, 2018–2021)

Additional details in the next pages

SOURCE: Penchansky & Thomas (1981); Saurman (2016); Levesque, Harris & Russell (2013), Int J Equity Health 12:18; WHO (2018–2021). See next pages for detailed sources

We used the following framework to collect considerations from the desk review (1/2)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Transparency	• Visibility of what services exist, pricing, who can use them, and what they provide
		Outreach	• Community-based efforts to identify people and connect them to care
		Information	• Availability and clarity of information about services, locations, costs and what care is offered
		Screening	• Existence of systems to identify people with undiagnosed needs (e.g. case-finding, routine checks) and link them to care
	Patients (ability to perceive)	Awareness	• Whether people recognize symptoms, know that services exist and understand that care could help them
		Beliefs	• How personal or cultural beliefs shape whether symptoms are seen as needing professional care
		Trust	• Whether people feel confident that the service will be safe, fair and worth using
Acceptability	Systems	Professional values	• Provider attitudes and practice norms that shape how care is delivered
		Cultural norms	• How well services align with local languages, customs, and expectations about care
	Patients (ability to seek)	Personal values	• Whether the service matches a person's own preferences, comfort and sense of what is acceptable
		Social norms	• Influence of family, peers and community on whether it is acceptable to seek care for a given problem
Availability	Systems	Geographic location	• How close services are to the people who need them
		Logistics	• Practical features of operating hours, appointment systems and waiting times make services practically usable
		Supply	• Whether staff, medicines and equipment are consistently there when needed

SOURCE: Team analysis, based on the "Patient-Centered Access to Healthcare" Framework by Levesque JF *et al*. Patient-centered access to health care: conceptualizing access at the interface of health systems and populations (2013)

We used the following framework to collect considerations from the desk review (2/2)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability *(Cont'd)*	Patients (ability to reach)	Mobility	• People's ability to travel safely and physically reach facilities, considering transport, disability and terrain
		Social support	• Help from others that makes it possible to makes care easier to access
Affordability	Systems	Costs	• The direct price of care, tests or medicines
		Funding	• How services are financed and how that shapes what patients pay
		Opportunity costs	• Costs of seeking care, such as lost wages or time away from household duties
	Patients (ability to pay)	Income & assets	• Household financial capacity and buffers to cover both direct and indirect costs of care
		Health insurance	• Coverage that reduces what patients must pay themselves
Appropri-ateness	Systems	Healthcare workers' knowledge	• Whether health workers have the skills and knowledge to give the right care
		Coordination and continuity	• Whether care is joined up across visits, providers and levels of the system
	Patients (ability to engage)	Empowerment / Information	• A patient's understanding of their condition and ability to take part in care decisions.
		Adherence	• The ability to follow treatment and monitoring plans consistently.
		Caregiver support	• The help patients receive from family or others to stay on treatment and manage care.

SOURCE: Team analysis, based on the "Patient-Centered Access to Healthcare" Framework by Levesque JF *et al*. Patient-centered access to health care: conceptualizing access at the interface of health systems and populations (2013)

We used the following logic to qualitatively assess the relevance of the identified challenges

High

The challenge affects a large number of patients and leads to serious consequences and is often explicitly documented as a major barrier in policies, studies, or program reports

Medium

The challenge affects a smaller or more specific group of patients and has noticeable but less severe effects on care and outcomes

Low

The challenge is not a major driver of poor outcomes, it mostly causes inconvenience or frustration for some patients or providers, with limited impact

SOURCE: Team analysis

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Interviews summaries

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List interviewees for stakeholders' consultations

Category	Interviewee
Expert	Cécile Macé (Global expert on access to medicines)
Insulin/NCD focused organizations	Dr. Eva Njenga (Director, Kenya Diabetes Management and Information Centre)
	HPAC Kyrgyzstan – Adyl Temirov (Director, Health Policy Analysis Center, Healthcare Financing Expert), Aida Abdraimova (Senior Analyst, Health Policy Analysis Center, PHC services and drug supply Expert)
	CRONICAS Peru – Dr. Maria Lazo (Researcher, Project Lead), Silvana Perez Leon (Project Manager), Janeth Tenorio (Lead Researcher)
	Dr. Kaushik Ramaiya (Tanzania NCD Alliance)
Market shaping organizations	CHAI – Dr. Olatubosun Akinola (Senior Director, Global NCDs), Dr. Cyrus Baidoo (Senior Program Manager, Global Markets), Clarke Bhandari Cole (Associate Director, Global NCDs)
Multilaterals	Dr. Sarah Rylance (WHO)
NCD expert	Dr. Rodrigo Cataldi (WHO)
Non-profits and federations	Dr. David Beran (NCD Policy Lab, Faculty of Medicine, University of Geneva)
	Dr. Sundeep Salvi (Expert on Asthma and COPD, GINA/GOLD)
Pharma (Inhaled drugs)	Pharma Co 1
	Pharma Co 2
Respiratory expert	Dr. Maria Sofia Cuba Fuentes (Respiratory expert, Center for Research in Primary Health Care (CINAPS), Peru)
	Dr. Jeremiah Chakaya Muhwa (Respiratory expert, Kenya and past President, The Union)
	Dr. Aizhamal Tabyshova (Respiratory expert, Kyrgyzstan)
	Dr. Stellah Mpagama (Respiratory Expert, Tanzania)

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Overall summary

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KII synthesis: Demand barriers dominate

KEY ISSUE	DESCRIPTION
Awareness, stigma and provider confidence major barriers	• **Awareness and stigma are named the single biggest barrier** — ICS coverage only 6–8% in India; myths that inhalers are "addictive" or last-stage, and that "steroids are bad"; patients may hide inhaler use, even in marriage discussions (R4). – **Provider knowledge is weak** — in one study 99% of students had seen an inhaler but 1% could demonstrate correct use; half thought inhalers addictive (R4). Primary-care clinicians feel less comfortable diagnosing/prescribing for respiratory disease than for hypertension (R6, R7, R10, R13, R16). – **Community misperception** — respiratory illness is widely assumed to be TB; antibiotic is misuse, and inhalers seen as last-resort, so patients stop once they feel better (R12, R13, R15).
Weak integration into primary care and chronic-care systems	• **Chronic respiratory care sits outside primary care** — patients are treated only during exacerbations with no follow-up or registries, and the cycle repeats (R6, R13). • **Specialist dominance blocks task-shifting** — guidelines written by specialists are impractical for PHC, and some resist devolving care tied to their income; ICS is often prescribable only by specialists, and specialists are concentrated in cities (R6, R9, R10, R15).
Diagnosis is constrained — especially for COPD	• **Spirometry is impractical in LMIC primary care** — costly, slow, needs trained staff, often unreliable; peak-flow (asthma) and emerging oscillometer (COPD) are more realistic screening tools (R4, R5, R10). • **COPD is underdiagnosed and often mislabeled as asthma**, typically detected only at referral/tertiary level; asthma is easier to pick up in primary care (R5, R9, R10, R13). ~60% of LMIC COPD is non-tobacco and poorly understood (R4). One informant argues the diagnostic barrier is overstated for asthma, where clinical judgement can suffice (R3).
Financing and political prioritization — respiratory is neglected vs. diabetes / hypertension	• **The core gap is financing and governance** (R5). Respiratory disease lacks a dedicated focal point, strategy and advocacy, and is structurally under-resourced — reportedly one dedicated CRD staff member at WHO HQ (R6, R7, R9, R13). • **Ministries favor high-volume diseases** (hypertension, diabetes, malaria) over smaller NCD programs (R7). Low insurance coverage (15–25% in Tanzania) means heavy out-of-pocket spend, and Direct Facility Financing lets districts deprioritize NCDs (R11, R12, R13).

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

KII synthesis: Supply side factors are also present

KEY ISSUE	DESCRIPTION
Market structure, supply and procurement	• **A concentrated, device-heavy market — a "photocopy of the insulin market" ;** an interviewee noted that, in some countries, a single registered manufacturers make any exit a national crisis (R5). • **Pharma investment usually for new/branded products**; access initiatives will only attract manufacturers if cost-neutral and non-threatening to high-income country pricing (R2, R3, R6). • **Weak forecasting drives stockouts and wastage**; pooled procurement is necessary but insufficient without real demand and affordability — the Asthma Drug Facility failed because services and demand were not in place (R1, R5, R6, R7, R8, R11, R15)
Regulatory pathways for drug–device products	• **LMIC regulators lack capacity to assess drug–device combinations and biologics** (R1, R7). • WHO Prequalification has drawn little NCD interest without buyer pull and is unlikely to be offered for inhaled medicines (R6, R7). • **The Collaborative Registration Procedure is more practical for inhalers**, since many are already SRA-registered (R6, R7).



SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

KII synthesis: Several suggestions were made by respondents regarding next steps

KEY ISSUE	DESCRIPTION
Lessons from insulin/diabetes and HIV/TB	• **Transferable models** — public-private partnerships, patient registries and forecasting, "champion"/dedicated trained staff, and device training all translate to asthma and COPD (R9, R11). The HIV/TB clinic platform offers a ready base to integrate chronic care (R11). • **Country routes** — integrating CRD into TB programs is promising (~80% of those screened are TB-negative) (R13); centralized insulin procurement brought gains but its history makes it hard to replicate for inhalers (R8, R9).
Some next steps suggested	• **Finalize and harmonize WHO CRD guidelines** with PEN, the EML and financing (R6, R7). • **Prove the model in 2–3 higher-readiness "champion" countries** over a 1–2 year proof of concept, tackling supply and demand together (R2, R5, R6, R12). – **Use multidisciplinary working groups** (procurement, financing, supply chain — not just specialists); start asthma in primary care and COPD at referral level; build data and regulatory readiness in parallel (R5, R6, R7, R9). • **Invest in COPD prevention** (R4)



SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

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KII insights: global insulin challenges

INSIGHT	DETAILS
Diabetes is now a global priority, but delivery remains the weak link	• Diabetes moved from a neglected issue to a global and national agenda priority over the last 20 years. (R14, R7) • T1D has benefited from donor and philanthropic support, but access still depends on external funding and donation programs rather than stable systems. (R14, R1) • T2D care remains weaker because LMIC guidelines and service models are often copied from high-income settings without adapting to local capacity. (R14) • The main unresolved issue is not awareness, but access to medicines, care delivery, and sustainable financing. (R14, R5)
Insulin access is fragile and highly unequal across LMICs	• No LMIC shows a large-scale insulin success story (free, low co-pay); mostly smaller-scale efforts. (R1) • Donation programs helped children/young adults survive and built infrastructure, but aren't sustainable, access depends on a few corporate donors' goodwill. (R14) • Global supply disruptions and stockouts are now affecting both LMICs and high-income countries. (R14)
Market structure is changing, but insulin remains hard to scale fairly	• The insulin market is still dominated by the three companies, while LMIC generic and biosimilar players focus more on home and high-income markets. (R14, R5) • Pricing pressure is less about headline vial price and more about predictability, markups, and the final cost to patients. (R14) • Voluntary pricing remains opaque, with limited transparency on actual prices and eligibility rules. (R14) • The shift toward GLP-1s and analogues creates additional supply risk for human insulin, which remains the core need in most LMICs. (R14)
The strongest global levers are pooled demand, better data, and practical market shaping	• CHAI and WHO both stress that demand must be demonstrated before manufacturers will engage at scale. (R5, R7) • ACCISS showed the value of deep country work, global market mapping, and proving that IP is not the main barrier. (R14) • WHO's CRP and PQ work is helping manufacturers navigate approval pathways, but pooled procurement remains the missing demand signal. (R7) • For future investment, the strongest approach is to focus deeply on a few demonstration countries, map procurement systems, and use those examples to build global pressure. (R14)

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

KII insights: country-specific insulin challenges

INSIGHT	DETAILS
Kenya: NCD systems are stronger, but insulin access still depends on financing and local ordering	• Kenya has a national NCD strategy and growing PHC infrastructure, but diabetes care still breaks at diagnosis, supply, and adherence. (R11) • Insulin is reliable mainly at Level 4 facilities; Level 3 access is improving in some counties, while Level 2 facilities usually lack diabetes clinics. (R11) • Stockouts are driven by poor planning and inequitable ordering, with counties sometimes receiving similar allocations despite different numbers of patients. (R11) • More than 75% of pharmacies were reported to stock unregistered medicines, raising quality concerns in the private market. (R11)
Kyrgyzstan: insulin access is relatively strong, but remote coverage and forecasting remain weak	• Insulin is free, with children receiving analogue pens and adults human insulin vials, but access is much harder outside major cities. (R8) • Centralized procurement and distribution remain the system's main strength, since they reduce dependence on private pharmacy priorities. (R8) • Distribution through private pharmacy networks is uneven, and the state system still struggles with regional access. (R8) • The diabetes registry and electronic patient card are not yet reliable enough for accurate forecasting or national planning. (R8)
Peru: insulin is formally covered, but geography and system fragmentation limit access	• Insulin is technically free, but availability is highly uneven, with clear gaps between Lima and other regions. (R9) • Primary care often lacks insulin, so patients are pushed to secondary or tertiary facilities and specialist-only prescribing creates further barriers. (R9) • Forecasting remains weak because the health information system tracks only dispensed medicines, not unmet need. (R9)
Tanzania: system structure is strong, but insulin access is still donor-dependent and uneven	• Tanzania has built a strong decentralized NCD platform, but insulin stockouts still occur at the individual facility level. (R12) • The CDIC program has enrolled about 6,800 children and extended free insulin support up to age 25. (R12) • Local facility boards often prioritize malaria, pneumonia, and gastroenteritis over insulin, causing stockouts despite MSD central procurement. (R12) • For T1D, the system still depends heavily on Novo Nordisk and Eli Lilly donation programs (R12)

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

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APPENDIX / INTERVIEWS SUMMARIES

Inhaled medicines focused summary

Methodology
Framework definition
Interviews summaries
- Overall summary
- Insulin focused summary
- **Inhaled medicines focused summary**

Detailed challenges (desk review)
Detailed initiatives

KII insights: global inhaled medicine challenges and opportunities

INSIGHT	DETAILS
The biggest barrier is weak demand, not just price	• Even when products are on EML, countries often do not have a clear picture of how many patients need them because the registry part is missing. (R1) • Controller medicines such as ICS and ICS-LABA are especially underused because clinicians and patients still rely on cheap relievers like salbutamol. (R4, R3)
Diagnosis and training are weak at the front line	• Asthma is easier to identify at lower-level facilities, while COPD is more neglected, diagnosed later, and typically requires tertiary-level spirometry (R5) • Spirometry is not a practical LMIC solution at scale, uncomfortable, expensive, needs scarce trained technicians, and even in experienced hands half of tests are poor quality (R4) • Inhaler technique remains a major gap, with limited provider training and few structured programs for patient counselling. (R1) • Over-reliance on spirometry can bottleneck care, a simpler approach is to rule out active TB with a chest X-ray, then proceed directly to a trial of treatment based on clinical symptom (R4)
The market is concentrated	• The market is highly concentrated, with GSK's exit from certain countries leaving AstraZeneca as the main inhaled-medicine supplier. (R5) • Single-manufacturer markets create monopoly and supply risks, making multiple registered manufacturers critical for competition, lower prices, and resilient supply chains. (R2, R7)
The best path forward is to prove the model in a few countries	• Start with a few high-readiness, high-volume countries to prove demand and achieve production scale that lowers COGS. (R5) • Strong demand forecasting, regulatory readiness, and clear government commitment are essential to attract suppliers and build viable markets. (R5, R2) • Countries need to integrate asthma and COPD into NCD care, not leave them as isolated respiratory issues. (R6, R7, R2) • WHO, governments, and pharma will all need to move together; no single actor can solve it alone (R3)

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

KII insights: country-specific inhaled medicine challenges and opportunities

INSIGHT	DETAILS
Kenya: care exists on paper, but most patients still do not get the right treatment	• In practice, inhalers are mostly unavailable at dispensaries and health centers; patients there are often given only salbutamol tablets. (R15) • A budesonide-formoterol canister costs about 1,500–2,000 KES, which is too expensive for many households. (R15) • Many patients first seek care from pharmacies, where they often buy antibiotics without a prescription. They may then be repeatedly treated for pneumonia, oral steroids, or salbutamol instead of receiving controller inhalers. (R15)
Kyrgyzstan: products exist, but cost and poor diagnosis limit use	• ICS+LABA is included in the national EML and in updated MoH clinical protocols (including pediatric) for asthma and COPD (R8, R16) • There is no active screening system, and primary-care providers generally cannot interpret spirometry, suspected cases are referred to tertiary care. (R16) • Patients are eligible for 50% reimbursement only at designated public pharmacies. However, due to distance barriers, many instead purchase medications at full price from private pharmacies and discontinue treatment within 1-2 months. (R16)
Peru: the main problem is poor primary care access and weak follow-up	• Asthma and COPD are often underdiagnosed, and patients are usually treated only with rescue inhalers like salbutamol. (R9)(R10) • Many primary care facilities do not have spirometers, and clinicians often are not trained to read spirometry results. (R10) • Currently, there are no structured training programs. About 10 years ago, some facilities had dedicated nurses or physicians teaching inhaler techniques weekly, but this is no longer the practice (R10) • Adherence support is weak due to lack of “counter-transference,” as specialists tend to retain rather than refer patients back to primary care. (R10)
Tanzania: the system is stronger than access, but respiratory care is still low priority	• Respiratory receives far less attention than diabetes/hypertension. (R13) • No organized lower-level COPD pathway; patients are routed through TB evaluation, with diagnosis largely limited to higher referral levels many cannot reach. (R13) • No recording/tracking registries or formal GP training exist for chronic asthma management. (R13) • Programs such as IMPALA, ITAR, WHO pilots, and spirometry training at Kibong’oto are trying to build a pathway for better respiratory care. (R13)

SOURCE: In-line with text; Analysis of 16 KIIs as of 2nd September 2026, (Rxx) denotes the anonymized respondent number

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APPENDIX / DETAILED CHALLENGES (DESK REVIEW) / INSULIN

Global / Cross-country

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Detailed challenges (desk review)
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Global / Cross-country
Kenya
Kyrgyzstan
Peru
Tanzania
Inhaled medicines
Detailed initiatives

The following challenges were identified for insulin access at global level (1/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Transparency	• **Lack of Price Transparency:** There is little transparency regarding the selling and buying prices of insulin, including manufacturer selling prices, mark-ups, and procurement data. **[High]** (Insulin Price Components: Case Studies in Six Low/Middle-Income Countries, 2019)
		Outreach	• **Poor Community Outreach:** There is a lack of community-based interventions, screening camps, and targeted outreach programs to detect diabetes early and educate the public in LMICs. **[High]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026)
		Information	• **Lack of awareness of Entitlements:** Even when national health insurance schemes or government programs cover the cost of diabetes commodities, there is often a lack of clear information provided to the public. As a result, many people living with diabetes do not know about these entitlements, leading to low coverage level. **[Medium]** (Market Report of Diabetes Self-Monitoring Devices, 2021)
			• **Inadequate Clinical Guidelines:** National treatment guidelines in some countries fail to recommend optimal glucose self-monitoring frequencies or restrict access to diabetes management technologies due to resource constraints **[High]** (Market Report of Diabetes Self-Monitoring Devices, 2021)
			• **Regulatory Barriers:** Local regulatory authorities often lack technical capacity to evaluate biosimilars, and the uptake of the WHO prequalification program for alternative insulin brands was slow thus preventing cheaper, safe competitors from entering the market **[High]** (Prequalification of insulin: what is missing?, 2022)
		Screening	• **Inadequate Diabetes Screening:** Significant gaps exist in screening for both diabetes and its complications due to a lack of diagnostic facilities, point-of-care devices, and trained primary care providers. **[High]** (The Road to Free Insulin: Lebanon Case Study, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (1/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Patients (ability to perceive)	Awareness	• **Poor Symptom Recognition:** In many communities, there is a severe lack of knowledge regarding the early symptoms of diabetes, leading individuals to misattribute warning signs to temporary fevers, malnutrition, or other ailments. This causes massive delays in diagnosis, often resulting in care only when fatal complications arise. **[High]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026)
		Beliefs	• **Misconceptions and Traditional Beliefs:** many individuals attribute diabetes to witchcraft or view insulin as a last resort, fostering reliance on traditional healers. **[Medium]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026; Insulin Users' Perspective Profile, 2017)
		Trust	• **Mistrust of Local Products:** Patients and doctors often distrust domestically manufactured or generic insulins, preferring more expensive imported products from multinational companies. **[Medium]** (Challenges constraining access to insulin in the private-sector market of Delhi, India, 2016)
Accept-ability	Systems	Professional values	• **Fear of Prescribing:** Physicians, particularly at the primary care level, frequently delay the initiation of insulin therapy due to a fear of causing hypoglycemia. **[High]** (A global perspective on the issue of access to insulin, 2021)
			• **Resistance to Task-Shifting:** Primary care and family doctors often hold the attitude that diabetes management is exclusively the responsibility of endocrinologists, resulting in a lack of professional commitment to early detection and routine patient follow-up at the community level. **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)
		Cultural norms	• **Culturally Non-adapted Education:** Diabetes education materials and self-management programs often lack cultural adaptation and fail to incorporate the specific perspectives and realities of local populations. **[Medium]** (Beyond Access to Insulin: A Health Systems Approach to Managing Type 1 Diabetes, 2019)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (2/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Accept-ability *(Cont'd)*	**Patients (ability to seek)**	**Personal values**	• **Fear of Needles and Pain:** Patients often experience a fear of frequent finger pricking and daily insulin injections, which acts as a barrier to seeking and adhering to care. **[Medium]** (Market Report of Diabetes Self-Monitoring Devices, 2021; Insulin Users' Perspective Profile, 2017)
		Social norms	• **Social Stigma and Secrecy:** A strong societal stigma surrounding diabetes makes it socially unacceptable for some to disclose their diagnosis, leading individuals to hide their condition to avoid community judgment or protect marriage prospects. **[High]** (Spotlight on India - DIAMOND 2A Webinar series: "Data and type 1 diabetes: lessons and experiences", video, 2025)
Availability	**System**	**Geographic location**	• **Centralized Healthcare Delivery:** Diabetes care is typically centralized at tertiary hospitals in large cities, requiring long travel distances and high transportation costs. **[High]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023)
		Logistics (opening hours, appointment mechanisms, etc.)	• **Inadequate Infrastructure Logistics:** Weak procurement processes, poor quantification of national needs, and inefficient distribution logistics lead to frequent stockouts and expired insulin. **[High]** (Access to insulin: applying the concept of security of supply to medicines, 2019)
			• **Cold Chain Requirements:** Insulin must be refrigerated, which represents a major logistical challenge in LMICs due to poor transport infrastructure and no adequate conditions for insulin storage (cold chain). **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)
			• **Complex System Navigation and Long Waiting Hours:** Most individuals have consultations only once a month, facing long waiting times and difficulty navigating the system for laboratory tests, accessing medicines, and specialists **[High]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (2/4)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	System	Supply	• **Poor Public Availability:** Insulin is frequently unavailable in public health facilities, forcing patients to rely on more expensive private sector pharmacies. **[High]** (A global perspective on the issue of access to insulin, 2021)
			• **Shortages and Stockouts:** Recurrent supply disruptions and manufacturer stockouts create severe availability gaps for insulin at the point of service delivery. **[High]** (Documenting global Insulin Shortages and Stockouts 2023-2025)
			• **Single Source Dependency:** Many LMICs import insulin from only one country or manufacturer, leaving their populations highly vulnerable to trade shocks and supply disruptions. **[Medium]** (Access to insulin: applying the concept of security of supply to medicines, 2019)
			• **Incompatible Monitoring Devices:** Test strips often only work with specific proprietary meters, locking users into expensive ecosystems or disrupting care if specific strips stock out. **[High]** (Market Report: Diabetes Self-Monitoring Devices in LMICs, 2021)
			• **Market Domination:** The global insulin supply is controlled by 3 multinational companies (Novo Nordisk, Eli Lilly, Sanofi), limiting competition and giving them outsized pricing power. **[High]** (A global perspective on the issue of access to insulin, 2021)
	Patients (ability to reach)	Mobility	• **Long Travel Distances:** Patients often has to travel long distance to visit the doctor to get free insulin **[High]** (Insulin Users' Perspective Profile, 2017)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (3/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability *(cont'd)*	**Patients (ability to reach) (cont'd)**	**Mobility** *(cont'd)*	• **High Transportation Costs:** The expense of transit to reach distant healthcare facilities creates a massive financial barrier, with surveys showing that 61% of patients in some LMICs identify transport costs as a main problem. **[High]** (Company and Company-supported Programs with a Component of Donated Insulin in Low- and Middle-income Countries, 2018)
		Social support	• **Lack of Social Support:** Patients often face a lack of understanding or support from family and the public, leading to anxiety, stress, and difficulties in adhering to strict diabetes management routines. **[Medium]** (Family Support and Diabetes: Patient's Experiences From a Public Hospital in Peru, 2018) (Insulin Users' Perspective Profile, 2017)
Affordability	**System**	**Costs**	• **Supply Chain Mark-ups:** Cumulative mark-ups from Import to wholesalers, and retailers significantly increase the final retail price paid by consumers. **[High]** (Insulin Price Components: Case Studies in Six Low/Middle-Income Countries, 2019)
			• **Import Tariffs and Taxes:** Many countries apply import duties and value-added taxes on insulin, which directly drives up the retail cost for patients. **[Medium]** (Insulin Tariffs and Taxes Profile)
			• **Shift to Expensive Analogues:** Manufacturers frequently withdraw older, affordable human insulins from the market to push more expensive and patented analogue insulins. **[High]** (Access to insulin: applying the concept of security of supply to medicines, 2019)
			• **Lack of information transparency:** There is very little transparency in the selling and buying prices of insulin, and governments are often entirely unaware of manufacturer differential pricing schemes that could lower prices **[Medium]** (GOVERNMENT PROCUREMENT OF INSULIN: CASE STUDIES IN 11 LOW- AND MIDDLE-INCOME COUNTRIES, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (3/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	System	Costs	• **Incompatible Monitoring Devices:** Test strips often only work with specific proprietary meters, locking users into expensive ecosystems or disrupting care if specific strips stock out. **[High]** (Market Report: Diabetes Self-Monitoring Devices in LMICs, 2021)
		Funding	• **Inadequate Public Financing:** There is a severe lack of dedicated donor funding allocated for insulin. **[High]** (Access to insulin: applying the concept of security of supply to medicines, 2019)
		Opportunity costs	• **Limitations to Employment:** The rigorous daily demands of managing diabetes and frequently having to seek care create significant barriers for patients and their caregivers in finding and maintaining stable jobs. **[Medium]** (Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024)
			• **Family Opportunity Costs:** The continuous time and financial investments required for seeking and maintaining diabetes care consume massive proportions of family resources, forcing households to sacrifice the needs and opportunities **[High]** (Company and Company-supported Programs with a Component of Donated Insulin in Low- and Middle-income Countries, 2018)
	Patients (ability to pay)	Income & assets	• **Unaffordable Out-of-Pocket Payments:** Patients paying out-of-pocket often need to spend several days' wages just to afford a single month's supply of insulin. This creates an insurmountable financial barrier for low-wage earners. **[High]** (Insulin prices, availability and affordability in 13 low-income and middle-income countries, 2019)
		Health insurance	• **Limited Insurance Coverage:** National health insurance schemes frequently offer incomplete coverage, sometimes covering medications but excluding essential self-monitoring devices, test strips, or syringes. **[High]** (Market Report of Diabetes Self-Monitoring Devices, 2021; Availability, prices and affordability of self-monitoring blood glucose devices: surveys in six low-income and middle-income countries, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (4/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability *(Cont'd)*	**Patients (ability to pay)** *(cont'd)*	**Health insurance *(cont'd)***	• **Absence of Universal Coverage:** For type 1 diabetes, many countries do not necessarily provide full coverage for insulin and diabetes supplies within the context of UHC. even countries with more advanced universal coverage systems may choose not to cover all insulin types or supplies, especially analogues **[High]** (A global perspective on the issue of access to insulin, 2021; Alternative Funding Sources to Improve Insulin Access: A Briefing Document for Low- and Middle-income Countries, 2018)
Appropri-ateness	**System**	**Healthcare workers' knowledge**	• **Shortage of Trained Workers:** Primary healthcare workers often lack the knowledge, experience, and training to confidently prescribe insulin or manage diabetes complications. **[High]** (A global perspective on the issue of access to insulin, 2021)
		Coordination and continuity	• **Fragmented Medical Records:** Patient records remained paper based with the challenge of the information not always following the individual throughout the system. Beyond the actual availability of data, there is also an issue of how data were used for monitoring as well as its linkage with quantification of needs for insulin and other supplies. **[Low]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023)
	Patients (ability to engage)	**Empowerment/ Information**	• **Limited patient education and support on glucose monitoring:** High rates of health illiteracy in many LMICs inhibit individuals from accurately interpreting the numerical readings from their glucose meters **[High]** (Market Report of Diabetes Self-Monitoring Devices, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access at global level (4/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropri-ateness	Patients (ability to engage)	Empowerment/ Information	• **Inability to Titrate Insulin:** The main self-reported reasons for not achieving HbA1c < 7.0%, the standard target for glycemic control, in insulin using subjects were lack of insulin titration and lack of experience in self-management of insulin dosing **[Medium]** (Suboptimal glycemic control and prevalence of diabetes-related complications in Kenyan population with diabetes: cohort analysis of the seventh wave of the International Diabetes Management Practices Study (IDMPS), 2021)
		Adherence	• **Pain of Routine Testing:** The daily requirement of conventional self-monitoring using painful finger-prick blood samples is frequently viewed as inconvenient, disruptive, and least favorite. This can lead to testing their blood sugar less often than recommended **[High]** (Beyond Access to Insulin: A Health Systems Approach to Managing Type 1 Diabetes, 2019)
			• **Inability to Afford Diets:** Even when patients receive appropriate nutritional guidelines, adherence is often derailed because lower-income families cannot afford the foods considered part of a healthy diabetes diet. This socioeconomic barrier forces them to abandon their recommended dietary plans in favor of cheaper, unhealthier options. **[High]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023)
		Caregiver support	• **Caregiver Burden:** Caregivers experience significant emotional and financial stress, often having to leave jobs or lacking the proper resources and training to support daily diabetes management. **[Medium]** (Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024)

SOURCE: In-line with text; Team analysis

The Union

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Kenya

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The following challenges were identified for insulin access in Kenya (1/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Transparency	• N/A
		Outreach	• **Low Household Visitation by Community Health Volunteers:** Despite a national strategy designed to deliver continuous diabetes education and self-management support directly to patients' homes, the health system fails to reach the vast majority of rural patients, leaving them isolated in their daily disease management because of a low prevalence of household visitations by the Community Health Volunteers (27.3%) **[Medium]** (Care-Seeking Dynamics among Patients with Diabetes Mellitus and Hypertension in Selected Rural Settings in Kenya, 2019) • **Futile Medication Referrals:** Community outreach efforts to connect patients to care fail when patients know insulin and other drugs are unavailable, as Community Health Workers refer at-risk individuals to clinicians, but when diagnosed patients receive no follow-up care, patients see referrals as pointless since referred individuals often visit the clinic once, wait in long lines, and leave without medication, forcing them to pay out-of-pocket at private pharmacies, undermining trust in Community Health Workers. Only 42% of patients maintain continued follow-up after seeking care within the public sector. **[High]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025; Dynamics, Impact, and Feasibility of Self-Monitoring of Blood Glucose in the Rural, Resource-Constrained Setting of Western Kenya, 2015) • **Outreach Security Risks:** Community Health Workers face major challenges in informal settlements because of poor sanitation, crime, and general security concerns that make it difficult to work safely. As one Community Health Worker explained, robberies and crime make some neighborhood too risky to visit, while a clinical officer noted that outreach often requires informing the area chief first. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (1/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Information	• **Provider Unawareness of Insurance Entitlements**: A lack of clear knowledge among healthcare workers regarding exactly which diabetes services are covered under the National Health Insurance Fund Supa Cover scheme results in patients being wrongfully denied care, as workers incorrectly inform patients that certain services are not covered and turn them away to seek out-of-pocket care. In one example, a patient was told by a hospital worker that their National Health Insurance Fund card could not be used for an X-ray, only to later find out from a different nurse that the service actually was covered. **[High]** (Examining the responsiveness of the National Health Insurance Fund to people living with hypertension and diabetes in Kenya: a qualitative study, 2023)
		Screening	• **Lack of Routine Screening:** There is currently no routine screening for NCDs at healthcare facilities in informal settlements (slums), and only occasional ad hoc events or donor- and private-sector-funded programs allow CHWs to carry out screenings at faith-based organizations. As one nurse explained, people usually do not go for screening unless they are sick, and only then do they discover high blood sugar. A physician added that if basic screening items such as glucose strips, glucometers, and gloves were available, more CHWs could be involved in community-based NCD interventions. **[High]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025) • **Missed Opportunities for Diabetes Diagnosis:** The health system fails to identify undiagnosed individuals who need insulin. In Kenya and other sub-Saharan African countries, doctors often recommend an HIV test at the slightest sign of relevant symptoms, but they are not equally aggressive in testing for diabetes. If diabetes screening were done more systematically, more cases could be diagnosed earlier. **[Medium]** (Pathways and Barriers to Diabetes Screening: Observations from Rural Kenya, 2015)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (2/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont.)	Patients (ability to perceive)	Awareness	• **Lack of Symptom Awareness**: Initial symptoms of diabetes such as frequent urination and excessive thirst may seem like minor symptoms to patients who are uneducated about diabetes, and see in them no justification for seeking medical care. **[Medium]** (Pathways and Barriers to Diabetes Screening: Observations from Rural Kenya, 2015) • **Low Insulin Pen Awareness and Use at Public Hospitals**: Patients at public facilities showed lower awareness of insulin pens than those at private facilities. Only 42.7% of Kenyatta National Hospital (a Public Hospital) patients knew about insulin pens, compared with 82.7% at PKH (a Private Hospital). Public facility patients were also less likely to use insulin pens, with 22.7% on pens versus 40.0% at PKH. **[Low]** (Assessing and Comparing Knowledge, Attitudes, and Use of Insulin Pens in Public and Private Hospitals in Kenya, 2025)
		Beliefs	• **Reliance on Traditional Healers:** Beliefs in the efficacy of alternative therapies delay the use of insulin and conventional medicine, as some individuals rely on traditional healers (e.g. Mganga wa kienyeji) and herbal medicine, choosing not to use conventional medications, and by the time they realize that this medicine is not working, the disease has progressed unchecked, leading to serious complications that require urgent medical intervention. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025) • **Misconceptions and Traditional Beliefs:** Some people associate NCDs, including diabetes, with curses or witchcraft, which fuels fear and misinformation. These beliefs can lead many patients to delay seeking proper medical care and can also interfere with effective disease control and management. **[Medium]** (Determinants of Non-Adherence to Treatment Among Patients with Type 2 Diabetes in Kenya: A Systematic Review; Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025) • **Fatalistic Views About Diabetes:** Many individuals perceived diabetes as an inevitable death sentence. This fatalistic perception leads them to avoid screening, believing that detecting the disease early will not make a difference in their outcome. **[High]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (2/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont.)	Patients (ability to perceive)	Trust	• N/A
Acceptability	System	Professional values	• **Provider Hesitancy to Prescribe Insulin:** Fear of hypoglycemia and a lack of confidence in prescribing routine insulin therapy due to inadequate training can make healthcare providers hesitant to start or manage insulin treatment. **[Medium]** (Clinical Inertia to Initiation of Insulin Therapy among Patients with Type 2 Diabetes in Moi Teaching and Referral Hospital, Kenya: A Mixed Methods Study, 2024) • **Rushed Clinical Consultations:** The clinicians are very busy and take little time with patients. Patients, therefore, leave with less information than they would need. **[High]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)
		Cultural norms	• **Dietary Advice That Does Not Fit Local Realities:** Healthcare services often give dietary guidance for diabetes and insulin management that clashes with the cultural and economic realities of informal settlements. Providers noted that when patients are told to eat specific foods, many can only afford staple foods like “ugali”. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (3/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability (Cont'd)	Patients (ability to seek)	Personal values	• **Treatment Dropout After Symptom Improvement:** A significant number of respondents in a study, 30%, reported dropping out of treatment because they felt better and believed they no longer needed treatment. Others stopped because they thought the disease was not serious. **[Medium]** (Care-Seeking Dynamics among Patients with Diabetes Mellitus and Hypertension in Selected Rural Settings in Kenya, 2019) • **Psychological Barriers to Insulin Use:** Psychological insulin resistance refers to the barriers that prevent patients from starting or continuing insulin therapy. These barriers often include fears that insulin is harmful, concerns about adverse effects such as hypoglycemia, and worries about weight gain or painful injections. In one study, 47% of patients cited the risk of hypoglycemia and 35% cited weight gain as concerns. **[High]** (Prevalence of Psychological Insulin Resistance among Patients with Type 2 Diabetes at Kenyatta National Hospital, Kenya, 2017.pdf; Assessing and Comparing Knowledge, Attitudes, and Use of Insulin Pens in Public and Private Hospitals in Kenya, 2025.pdf; Clinical Inertia to Initiation of Insulin Therapy among Patients with Type 2 Diabetes in Moi Teaching and Referral Hospital, Kenya: A Mixed Methods Study, 2024) • **Perceived Loss of Freedom:** Insulin therapy was often seen as limiting daily life and reducing personal control. In one survey, 44.8% of insulin-naïve patients believed insulin would restrict their lives, while 46.4% reported a loss of self-control and flexibility. Other concerns included the time and energy required for insulin use (28.9%), the belief that it would interfere with responsibilities (24.8%), and the fear of giving up enjoyable activities (31.4%). Patients also described practical challenges such as rigid meal times, difficulty traveling, and the need to keep insulin cold. **[High]** (Prevalence of Psychological Insulin Resistance among Patients with Type 2 Diabetes at Kenyatta National Hospital, Kenya, 2017)
		Social norms	• **Stigma and Non-Disclosure:** Healthcare providers and patients recognized the stigma associated with NCDs, including diabetes, within the community. The fear of being judged or ostracized can lead people to avoid screenings and self-management of NCDs. Often, patients do not want to disclose their condition to others including family members. **[High]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025) • **Public Injection Stigma:** There is stigma with using insulin especially in public places where they might need to inject before they feed and so on. **[Low]** (Clinical Inertia to Initiation of Insulin Therapy among Patients with Type 2 Diabetes in Moi Teaching and Referral Hospital, Kenya: A Mixed Methods Study, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (3/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	System	Geographic location	• **Geographic and Structural Barriers to Medicine Access:** Patients faced long distances to reach care, with the average distance to the nearest public facility at 11.6 km compared with 9.0 km to the nearest non-profit private facility. Access was also limited by the health system itself: although standard treatment guidelines include diabetes medicines at primary care level, the Kenya Essential Medicines List restricts supply to level 4 hospitals, a county referral hospital that provides more specialized services than primary care clinics. This means public clinics and health centers are not required to stock these medicines, pushing many patients to seek them in the private sector or at higher-level hospitals. **[High]** (Access to Diabetes Medicines at the Household Level in Eight Counties of Kenya, 2018)
		Logistics	• **Understaffing and Long Queues:** Patients often faced long waiting times because there was only one doctor available. These delays affected daily earnings for casual laborers and discouraged people from using public health facilities. As a result, some patients chose to buy medicines from local pharmacies instead of waiting for care. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025) • **Insulin Storage Challenges at Home:** Patients often lack proper refrigeration or other suitable facilities for storing insulin at home, and the medicine may lose its effectiveness if not stored correctly. This is another barrier to insulin use. **[High]** (Clinical Inertia to Initiation of Insulin Therapy among Patients with Type 2 Diabetes in Moi Teaching and Referral Hospital, Kenya: A Mixed Methods Study, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (4/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont'd)	System	Supply	• **Delayed Medicine Supply and Insulin Stockouts:** Patients faced severe and life-threatening delays in insulin supply from the central medical supplier. Providers reported that orders placed in August might not arrive until the following March, and some facilities went without insulin for three months due to shortage of insulin. These shortages led to severe adverse events and even death due to lack of insulin. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025; Improving access to diabetes care for children: An evaluation of the changing diabetes in children project in Kenya and Bangladesh, 2021) • **Inadequate Diagnostic Equipment:** Primary clinics consistently lack the tools necessary to monitor blood glucose and manage insulin therapy, as Blood glucometer machine plus glucometer strip are generally the least reported in all counties. With some counties, especially Homa Bay and West Pokot County, reporting the lowest proportion of facilities in primary level possessing the items at 11% and 24%, respectively. Consequently, most patients receive only a single point-of-care (POC) glucose test on the day of their clinic visit due to resource constraints. **[High]** (Diabetes health care specific services readiness and availability in Kenya: Implications for Universal Health Coverage, 2023; Dynamics, Impact, and Feasibility of Self-Monitoring of Blood Glucose in the Rural, Resource-Constrained Setting of Western Kenya, 2015) • **Shortage of Specialists:** Availability of human resources for health was low, with a mean availability of 46% for NCD, including insulin, related staff. NCD specialists and nutritionists were among the least available cadres. Across 12 counties, the availability of NCD specialists was generally low, except in Machakos County, where at least 50% of assessed facilities reported having them. **[High]** (Diabetes health care specific services readiness and availability in Kenya: Implications for Universal Health Coverage, 2023)
	Patients (ability to reach)	Mobility	• **Extreme Clinic Distances:** In Kenya, many live long distances from clinics, resulting in journeys of up to 300km at a cost of up to 500 KES (US $4) per person. **[High]** (Improving access to diabetes care for children: An evaluation of the changing diabetes in children project in Kenya and Bangladesh, 2021)
		Social support	• **Underfunded Support Groups:** Community support groups help make treatment more accessible by pooling resources and purchasing medication in bulk, but they struggle to remain financially sustainable. Joining often requires a registration fee of approximately KES 1,000 (US$7.8) per month, and many members are unable to contribute consistently. As a result, support group leaders and members often make sacrifices to ensure that all patients still receive the medication they need. A 34-year-old male T2D patient who leads a support group described this reality: "We collect money and buy medicine at a wholesale price. However, some people in the support group cannot afford to contribute money to purchase medication. We cannot deny them medicine... The challenge, though, is that this affects the kitty, and when we run short of funds, the executive leaders of the support group sacrifice and ensure there is money to continue supporting the sick." **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)

SOURCE: In-line with text; Team analysis

KENYA

The following challenges were identified for insulin access in Kenya (5/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	System	Costs	• **High HbA1c Test Cost:** The glycated hemoglobin (or HbA1c) test is a powerful tool in diabetes diagnosis because it indicates long-term glucose levels independent of short-term fluctuations. However, the high cost of the test, approximately 1,000 KES ($12.00 USD), is a significant obstacle to improving glycemic control in diabetic patients. **[Medium]** (Pathways and Barriers to Diabetes Screening: Observations from Rural Kenya, 2015) • **High Insulin Market Prices:** Unsubsidized private market prices for insulin are expensive for most families in Kenya, with reports showing that in the open market, insulin can cost up to 800-1000 KES (~$8-10) per vial and even when public facilities provide a subsidized rate of 200 KES (~$2), it is still unaffordable for many families. **[High]** (Improving access to diabetes care for children: An evaluation of the changing diabetes in children project in Kenya and Bangladesh, 2021) • **Expensive Analogue Insulins:** The use of modern, long-acting insulin analogues is severely restricted in Kenya due to their high direct costs, as research at Kenyatta National Hospital showed prescribing was severely limited (up to only 3.6% of total insulin utilization) because these analogues have considerably higher prices (3.4x) than standard insulins on a defined daily dose basis. **[High]** (Assessing utilization and expenditure on long-acting insulin analogues in Kenya; findings and implications for the future, 2021)
		Funding	• **National Funding Gap:** The public health financing system severely under-allocates resources for non-communicable diseases compared to infectious diseases, with reports showing a 95% gap in funding needed for the prevention, treatment, and management of diabetes in the country, meaning the government relies heavily on patients paying out of pocket to finance the system. **[High]** (The economic burden of type 2 diabetes on the public healthcare system in Kenya: a cost of illness study, 2024)
		Opportunity costs	• **Lost Labor Income:** Patients reported long wait times at healthcare centers, leading to missed labor opportunities and lost income. **[High]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)
	Patients (ability to pay)	Income & assets	• **Destructive household trade-offs:** Limited income buffers force families into difficult financial choices around insulin therapy. Patients reported being unable to afford essential medicines because of poverty (the poverty rate is around 40%) and households often had to choose between food, education, transport, and medicine. This sometimes led to dangerous rationing, with patients either skipping insulin when it was needed or using only part of the dose so it would last longer. Lack of finances was the most frequently mentioned reason (in almost 40%) for dropping out of treatment or not initiating treatment upon diagnosis. **[High]** (Innovating to increase access to diabetes care in Kenya: an evaluation of Novo Nordisk's base of the pyramid project, 2019; Care-Seeking Dynamics among Patients with Diabetes Mellitus and Hypertension in Selected Rural Settings in Kenya, 2019; The World Bank)

SOURCE: In-line with text; Team analysis

KENYA

The following challenges were identified for insulin access in Kenya (6/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont'd)	Patients (ability to pay)	Health insurance	• **Low insurance penetration:** The vast majority of the population lacks formal financial risk-pooling mechanisms to pay for care or expensive medicines like insulin. Slightly over four-fifths of the population lack financial protection from health care costs, and specifically, 82% of women and 79% of men in Kenya do not have health insurance. This contributes to about 1.5 million Kenyans being pushed into poverty each year due to out-of-pocket spending. **[High]** (Socio-structural and direct health challenges related to illness management among patients with type 2 diabetes in Kenya and Tanzania during the COVID-19 pandemic- A qualitative inquiry; Care-Seeking Dynamics among Patients with Diabetes Mellitus and Hypertension in Selected Rural Settings in Kenya, 2019) • **Unaffordable Insurance Premiums:** For those attempting to participate in the national health insurance scheme, the direct financing cost of the scheme itself prevents sustained coverage, as the KES 500 per month premium (~US $4) was deemed to be beyond reach by some respondents, especially in rural areas, causing patients who need chronic care to regularly default. **[High]** (Examining the responsiveness of the National Health Insurance Fund to people living with hypertension and diabetes in Kenya: a qualitative study, 2023) • **Lack of NCD-Specific Insurance Policies:** The existing insurance frameworks fail to cater to the lifelong nature of diabetes care, as studies note that there is no specific health insurance policy that responds to the needs of chronically ill people specifically those with T2D, meaning the existing plans cover only a fraction of the medical bills. **[Medium]** (Socio-structural and direct health challenges related to illness management among patients with type 2 diabetes in Kenya and Tanzania during the COVID-19 pandemic- A qualitative inquiry; Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (7/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness	System	Healthcare workers' knowledge	• **Knowledge Gaps in Insulin Delivery and National Health Insurance Fund Coverage:** A study found that all physicians knew about insulin syringes, vials, and pens, but only 50% knew about the artificial pancreas. All the physicians who participated in the study agreed that insulin pens are not covered by NHIF. But the study found that insulin was listed as an essential medicine that would be supplied to a patient as part of the NHIF benefit package and that it would be "provided as per the needed care and based on the accreditation status of the health facility". **[Medium]** (Assessing and Comparing Knowledge, Attitudes, and Use of Insulin Pens in Public and Private Hospitals in Kenya, 2025) • **Lack of Community Healthcare Workers Training:** While CHWs are a helpful community resource, many of them know little about diabetes or have incorrect information. Additionally, workers at small clinics are often not properly trained to deal with blood, introducing the risk of infection to patients. A lack of appropriately trained health care workers in remote areas leaves patients with no other option than a hospital or major clinic. **[Medium]** (Pathways and Barriers to Diabetes Screening: Observations from Rural Kenya, 2015) • **Inadequate Clinical Training:** Clinicians lack the necessary training and confidence to initiate insulin therapy, leading to dangerous clinical inertia. A study at Moi Teaching and Referral Hospital found that clinician-related barriers included a lack of confidence to prescribe routine insulin therapy due to inadequate training, with one clinician directly admitting, that they are not very well trained to prescribe insulin. **[High]** (Clinical Inertia to Initiation of Insulin Therapy among Patients with Type 2 Diabetes in Moi Teaching and Referral Hospital, Kenya: A Mixed Methods Study, 2024) • **Lack of Pediatric Skills:** Healthcare workers are often untrained in treating children who require insulin for Type 1 diabetes, typically relying on adult protocols. Studies note that healthcare workers often lacked diabetes experience and considered T1DM a challenging disease to treat, and at a hospital, one health care worker expressed that they did not feel they have the skills to treat children, as they had not been trained in pediatric care. **[Medium]** (Improving access to diabetes care for children: An evaluation of the changing diabetes in children project in Kenya and Bangladesh, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kenya (7/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness	System	Coordination and continuity	• **Fragmented patient records and weak follow-up:** The lack of comprehensive, shared health information systems severely hinders continuity of care across visits. Providers often rely on patients to buy and bring their own record books. As one provider noted, most of them lose their health information. A single notebook, costing KES 20, is sometimes shared among the entire family. Without these records, proper follow-up becomes a major challenge. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025) • **Adulthood Transition Failures:** There could be a break in the continuity of care when pediatric patients age out of donor-supported insulin programs, as patients in Kenya felt they were given too little support in managing the transition to adulthood and the cessation of the free insulin supply. **[Medium]** (Improving access to diabetes care for children: An evaluation of the changing diabetes in children project in Kenya and Bangladesh, 2021)
	Patients (ability to engage)	Empowerment / Information	• **Poor Diabetes Literacy:** Many patients lack the basic knowledge needed to understand their condition and make informed decisions about insulin, as a study at Moi Teaching and Referral Hospital found that only 38.5% of patients had SKILLD [Spoken Knowledge in Low Literacy in Diabetes] scores of 50% and above, and other Kenyan patients displayed poor knowledge by noting that the disease comes from God. **[High]** (Clinical Inertia to Initiation of Insulin Therapy among Patients with Type 2 Diabetes in Moi Teaching and Referral Hospital, Kenya: A Mixed Methods Study, 2024; Determinants of Non-Adherence to Treatment Among Patients with Type 2 Diabetes in Kenya: A Systematic Review, 2021)

SOURCE: In-line with text; Team analysis

KENYA

The following challenges were identified for insulin access in Kenya (8/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont.)	Patients (ability to engage)	Adherence	• **High Treatment Dropout Rates:** Kenyan patients struggle to consistently engage with long-term care plans, as investigations into chronic disease activities in western Kenya revealed that only 42% of patients maintain continued follow-up after seeking care within the public sector, with another study finding that 30% indicated dropping out of treatment as a result of feeling better and, therefore, not needing treatment any more. **[High]** (Dynamics, Impact, and Feasibility of Self-Monitoring of Blood Glucose in the Rural, Resource-Constrained Setting of Western Kenya, 2015; Care-Seeking Dynamics among Patients with Diabetes Mellitus and Hypertension in Selected Rural Settings in Kenya, 2019) • **Poor Drug Compliance:** The majority of diabetic patients fail to consistently adhere to their prescribed medication regimens, as an investigation among T2DM patients on follow-up at Moi Teaching and Referral Hospital (Kenya) showed that the majority of the patients (72%) had poor compliance to drug treatment, heavily influenced by costs, lack of family support, and dissatisfaction with clinicians. **[High]** (Determinants of Non-Adherence to Treatment Among Patients with Type 2 Diabetes in Kenya: A Systematic Review, 2021) • **Suboptimal Blood Sugar Check:** Patients consistently fail to adhere to essential blood sugar check required for insulin therapy. Most participants in a study had their last blood sugar check within the past month, but a smaller share had more delayed or unknown testing. Specifically, 22.9% were tested less than a week ago, 57.1% about a month ago, 8.8% six months ago, 5.9% a year or more ago, and 5.3% did not know. This suggests that blood sugar tests are generally being done, though not always very recently. **[Medium]** (Care-Seeking Dynamics among Patients with Diabetes Mellitus and Hypertension in Selected Rural Settings in Kenya, 2019)
		Caregiver support	• **Elderly patients without caregiver support:** Elderly patients without caregivers are especially vulnerable. They may accidentally overdose on insulin without having eaten enough food to stabilize their blood sugar, which can lead to serious complications and, in some cases, death. **[Medium]** (Challenges and opportunities in screening and management of hypertension and type 2 diabetes in informal settlements in Nairobi, Kenya: A qualitative study of multi-sectoral stakeholders, 2025)

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

09

Kyrgyzstan

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Insulin
Global / Cross-country
Kenya
Kyrgyzstan
Peru
Tanzania
Inhaled medicines
Detailed initiatives

KYRGYZSTAN

The following challenges were identified for insulin access in Kyrgyzstan (1/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Transparency	• N/A
		Outreach	• N/A
		Information	• **Limited and Centralized Diabetes Education:** In Kyrgyzstan, patient education on insulin use and diabetes management is limited, as currently there are only 2 associations, Diabetes Association of Kyrgyzstan (created in 1998) and Diabetes Federation (established in 2008), which carry out educational activities and operate at the central level only in the capital, Bishkek. These activities are donor-funded and not regulated by the MoH and they do not work at the PHC (Primary Health Centre) level **[Medium]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Diabetes in Kyrgyzstan, 2024) • **Inadequate Type 1 training:** Doctors and specialized nurses in Kyrgyzstan receive type 1 diabetes education and support only at tertiary level facilities, i.e., highly specialized healthcare facilities (hospitals). Type 1 training involves teaching critical survival and self-management skills, which include understanding the effects of nutrition, exercise, and hormones on insulin need **[Medium]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023; Improving type 1 diabetes care globally: the importance of medical education, 2025)
		Screening	• **Ineffective Early Detection:** Screening systems in Kyrgyzstan fail to link patients to insulin therapy and care early, as diabetes prevention and early detection are ineffective due to a low level of professional knowledge and inadequate commitment of family doctors to diabetes management, particularly in rural areas where primary care is weak. There is insufficient preventive work and untimely detection of diabetes at the Primary Health Centre level; most diagnoses still result from self-referral to health centers. People with diabetes are referred to an endocrinologist for diagnosis confirmation, treatment correction and regular consultations. These functions are completely entrusted to endocrinologists, whose availability in regions is limited **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Diabetes in Kyrgyzstan, 2024) • **High Undiagnosed Rate:** The International Diabetes Federation estimates that there 256,000 people aged 20-79 living with type 2 diabetes (6.6% of the adult population) in Kyrgyzstan, with approximately 28% currently undiagnosed **[High]** (Diabetes in Kyrgyzstan, 2024; Beyond Access to Insulin: A Story of Two Approaches to Care, Video, 2024) • **Lack of PHC Commitment:** In Kyrgyzstan, identifying and registering new diabetes cases is significantly delayed because PHC doctors do not have the commitment to identify and register patients with diabetes in a timely manner, especially type 2 diabetes patients, due to low level of professional knowledge and inadequate commitment of doctors to diabetes management and completely rely to endocrinologists, whose availability in regions is limited. This lack of commitment contributes to a major discrepancy between official registry numbers (47,632 type 2 cases) and actual prevalence, as many individuals, particularly in rural areas, do not undergo appropriate examination **[Medium]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (2/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont.)	Patients (ability to perceive)	Awareness	• **Unaware of Monitoring Scheme:** Since mid-2024, 800 and 2,500 test strips for adults and children/teenagers, respectively, are provided annually at no charge as part of the State Guaranteed Benefits Package. Nevertheless, uptake remains low because prescriptions needed to be provided by family doctors whereas most people with type 1 diabetes are cared for specialists and many people are not able to afford the meter or were unaware of this scheme. **[High]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023; Availability, prices and affordability of self-monitoring blood glucose devices: surveys in six low-income and middle-income countries, 2025)
		Beliefs	• **Traditional Medicines:** The use of traditional medicine and supplements in Kyrgyzstan was also a possible barrier to adherence with contrasting and contradicting recommendations compared to what allopathic providers advise **[Medium]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023)
		Trust	• N/A
Acceptability	System	Professional values	• **Provider Fear of Insulin:** Primary care providers in Kyrgyzstan demonstrate hesitant attitudes toward insulin therapy, as it was often said by healthcare workers in interview that General Practitioners were not able to treat diabetes and that they were 'scared' of treating diabetes, especially using insulin due lack of experience and expertise, gaps in knowledge, fear of hypoglycemia, missing guidelines and even fear of prescribing insulin **[Medium]** (Addressing the double-burden of diabetes and tuberculosis: lessons from Kyrgyzstan, 2017; The Road to Free Insulin: Kyrgyzstan Case Study, 2021; A global perspective on the issue of access to insulin, 2021)
		Cultural norms	• N/A
	Patients (ability to seek)	Personal values	• N/A
		Social norms	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (3/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	System	Geographic location	• **Centralized T1D Care:** Geographic accessibility for insulin-dependent patients is limited in Kyrgyzstan, as health care for diabetes focused on hospitals, for type 1 diabetes mainly at national pediatric hospital. Additionally, HbA1c testing coverage was low nationally at 30–36% of diabetes patients in 2021–2022, but the regional gaps were even starker, with coverage falling to just 3.7% in Issyk-Kul and 7.7% in Ton in 2022, both far below the national average **[High]** (Beyond Access to Insulin: A Health Systems Approach to Managing Type 1 Diabetes, 2019; Assessment of the PHC service delivery to the population with specific conditions within the frames of the State Guaranteed Benefits Package, 2024) • **Lack of Local Stores:** Even within Bishkek, capital of Kyrgyzstan, patients cannot access insulin at primary care clinics due to absent local inventory. Insulin is received from the warehouse of the MoH and is distributed by the City Endocrinology Dispensary, and critically, there are no insulin stores in Family Medicine Centers, primary health care facilities at the district level, of Bishkek. When hospitalized, patients must rely on territorial hospitals requesting insulin delivery from FMC (Family Medicine Centre), creating unnecessary logistical barriers for routine access and insulin is not sold in the private pharmacy network. Those patients who live outside the district center in villages come regularly to the endocrinologist for advice and to get a free insulin, the chief nurse of the FMC typically hands over the insulin to patients as prescribed by the endocrinologist for two months **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021) • **Rural Specialist Shortage:** In Kyrgyzstan's regions and remote Family Medicine Centers, access to endocrinologists is also limited, and diagnostic follow-up for diabetes complications (such as nephropathy and retinopathy) by specialists like nephrologists and ophthalmologists is similarly constrained. According to the MoH, this shortage results in 68% of diabetes management cases decompensation of diabetes remains at the primary level, indicating that most patients experience disease progression due to inadequate specialist care (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (3/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	System	Logistics	• **Long Waiting Times:** Endocrinologists are available only at raion (district) level family medicine centers, so all patients visit the district-level center for consultations leading to heavy patient load and several hours of waiting time for endocrinologists' consultations, causing substantial delays in accessing essential diabetes care **[Low]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Addressing the double-burden of diabetes and tuberculosis: lessons from Kyrgyzstan, 2017) • **Cold chain inadequacies:** The physical equipment and infrastructure needed to safely store insulin inventory is missing from clinics, as many health organizations have no adequate conditions for insulin storage (cold chain). **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)
		Supply	• **Mountainous Terrain Barriers:** The mountainous terrain in Kyrgyzstan makes medicine distribution difficult, as supplies must pass through mountain roads and passes. This creates major challenges for delivering insulin and other medicines reliably to remote areas **[Medium]** (David Beran : L'insuline : 100 ans d'existence, toujours pas universel, Video, 2025) • **Inaccurate Insulin Planning:** Currently, insulin needs are not calculated accurately; estimates are based approximately on purchases from previous years. This leads to irrational insulin use, including underuse and shelf-life expiration of unused stock (note: quantified impact not available). However, some other regions and health facilities simultaneously experience insulin shortages **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021) • **Severe specialist shortage:** There is a lack of specialized medical staff available to provide necessary care, since in all regions there is a severe shortage of endocrinologists and well trained mid-level health personnel. Availability of endocrinologists in the Kyrgyz Republic does not exceed 0.2 per 10,000 population. **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021) • **Diabetes medication shortage:** Metformin, widely prescribed first-line oral medication primarily used to manage blood sugar levels in adults and children with Type 2 Diabetes, is now provided by the government with 50% discount for the insured (since 2021) but availability in the public sector was only 11.8% (2023) **[High]** (Diabetes in Kyrgyzstan, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (4/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont.)	System	Supply (Cont.)	• **Insulin syringe shortage:** While insulin itself might be provided, the required tools to administer it is not consistently supplied to patients, as the number of purchased insulin syringes is not enough, people must buy these using their own funds. Availability of syringes was 88% and 75% in the public and private sectors, respectively, while pen needles were 76.5% public sector and 0% private sector **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Diabetes in Kyrgyzstan, 2024) • **Insufficient Diagnostic Tools and Limited Test Access:** Basic diagnostic tests and blood cholesterol checks are free at the PHC level, but significant gaps persist. Reagents and test strips for blood glucose testing remain unavailable in many health organizations. Glycated hemoglobin (HbA1) tests are only available in private laboratories at 650 kyrgyz soms ($10) per test. Glucometer provision is low, with only 42% of respondents owning one, and the test strip reimbursement program has limited regional coverage. In the public sector glucose meters for self use were found to be available in 17.6% of facilities and 11.8% for test strips. Glucose meters were available 63.9% of private sector facilities, and test strips in 75%. **[Medium]** (Policy Brief Rapid Assessment Protocol for Insulin Access and Health Care for Patients with Diabetes; Diabetes in Kyrgyzstan, 2024)
	Patients (ability to reach)	Mobility	• **Rural travel burden:** Endocrinologists are available only at raion (district)-level family medicine centers, forcing rural patients living outside district centers to travel up to one hour by private transport using their own money for regular consultations and free insulin. Financial barriers extend beyond routine visits, as patients also face costs for transportation from FMCs to referred facilities **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Addressing the double-burden of diabetes and tuberculosis: lessons from Kyrgyzstan, 2017)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (4/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont.)	Patients (ability to reach)	Social support	• **Lack of professional support:** Patients lack dedicated professional help to navigate the psychological and social aspects of insulin-dependent diabetes, as there is insufficient social support for people with diabetes (lack of social workers, psychologists) **[Low]** (Diabetes in Kyrgyzstan, 2024)
Affordability	System	Costs	• **Expensive Analogue Insulin:** According to data shared by Aigerim Zhaparova, a diabetes advocate, 75% to 80% of the total allocated funds for diabetes were spent on analogue insulin. It should be noted that only children with type 1 diabetes are provided with analogue insulin, there are over 1,500 patients with type 1 diabetes. Thus, large share of the total allocated funds for diabetes is spent for Analogue Insulin. The rest of the budget is used to purchase human insulin for adults with type 1 and type 2 diabetes. **[Medium]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Diabetes in Kyrgyzstan, 2024; Launch Event - Access to Insulin 100 Years On, video, 2021)
		Funding	• **SGBP Funding Gap:** Systemic underfunding of the State-Guaranteed Benefit Package (SGBP) fails to provide full financial protection, forcing patients to pay out-of-pocket **[High]** (Coping with the economic burden of Diabetes, TB and co-prevalence: evidence from Bishkek, Kyrgyzstan, 2016) • **Unimplemented Diabetes Law Due to Funding Gaps:** Kyrgyzstan's 2006 "On Diabetes Mellitus" law mandates free diabetes management, including insulin, oral medications, glucose monitoring, inpatient care, consultations, and lab tests, with centralized insulin purchases by the Ministry of Health. However, insufficient funding leaves key components unrealized: glucose monitoring devices and insulin injection devices are not fully purchased **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)
		Opportunity costs	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (5/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont.)	Patients (ability to pay)	Income & assets	• **Catastrophic health spending:** The financial burden of purchasing out-of-pocket insulin and diabetes care severely damages household financial capacity, as research in Bishkek proves Catastrophic health spending is more likely in diabetes than in TB. 31% of patients with diabetes are likely to face catastrophic health spending, compared to just 8% of patients with TB **[High]** (Coping with the economic burden of Diabetes, TB and co-prevalence- evidence from Bishkek, Kyrgyzstan, 2016) • **Unaffordable wage ratio:** Low-income individuals lack the financial capacity to purchase insulin from private pharmacies when public stocks fail, the lowest paid person in the public sector would have to work more than a month to pay for their insulin for one month **[High]** (David Beran: L'insuline : 100 ans d'existence, toujours pas universel, 2025)
		Health insurance	• **Limited Reimbursement:** The average reimbursement level for diabetes medications sold in the pharmacy network is 61%, leaving patients to pay 39% out-of-pocket. Insured individuals can receive a 50% reimbursement for test strips bought in private pharmacies through the public sector's mandatory health insurance. However, the standard allocation is only 200 test strips per patient per year, or about 7% of the American Diabetes Association's recommended testing frequency for insulin-requiring individuals. **[Medium]** (Assessment of the PHC service delivery to the population with specific conditions within the frames of the State Guaranteed Benefits Package, 2024; Market Report: Diabetes Self-Monitoring Devices in LMICs, 2021) • **Lack of entitlement awareness:** Even when public insurance schemes offer reimbursements for necessary diabetes management supplies, many people living with diabetes do not know about these entitlements, leading to low coverage levels. Insulin is free of charge in the public sector, however, in 2023, 10% of households reported paying for their insulin, the median price being US$8.97 for 1000 IU human insulin and US$26.16 for analogue insulins. **[Medium]** (Market Report: Diabetes Self-Monitoring Devices in LMICs, 2021; Diabetes in Kyrgyzstan, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (5/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness	System	Healthcare workers' knowledge	• **Family doctors unprepared:** Despite increase in training, family doctors are not prepared to support management of people using insulin (all type 1 and some type 2). **[Medium]** (Diabetes in Kyrgyzstan, 2024)
		Coordination and continuity	• **Weak interagency cooperation:** Coordination at the higher policy level is fragmented, leaving the health ministry isolated in managing the disease, as health policy is considered to be an area of responsibility for the MoH only. Despite the fact that the government is involved in cross-sectoral coordination, interagency cooperation is one of the significant barriers to population-based interventions. Stronger cooperation would be needed with the Ministry of Finance to ensure proper budget allocation for insulin purchases, as well as with other ministries such as Education and regional and local government authorities. **[Medium]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021; Launch Event - Access to Insulin 100 Years On, 2021) • **Parallel Disease Management:** Diabetes and TB care in Kyrgyzstan operates in highly siloed, parallel systems with no integration between services. As doctors describe it: "Endocrinologist treats diabetes and we treat TB." Each specialty calls the other when needed, with joint consultations occurring only occasionally. Both conditions are treated separately in specialist facilities or wards, resulting in uncoordinated care for patients co-affected by diabetes and TB, despite diabetes care being available at Rayon, Oblast, and National levels. **[Low]** (Addressing the double-burden of diabetes and tuberculosis: lessons from Kyrgyzstan, 2017)
	Patients (ability to engage)	Empowerment / Information	• **Limited Diabetes Education:** Patients in Kyrgyzstan lack essential understanding of their condition, as people are poorly informed about the consequences of diabetes, healthy lifestyle, nutrition, physical activity, etc. Therefore, most do not adhere to continuous treatment and healthy lifestyle. **[High]** (The Road to Free Insulin: Kyrgyzstan Case Study, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Kyrgyzstan (6/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont.)	Patients (ability to engage)	Adherence	• **Low Dietary Adherence:** Diet was reported in Kyrgyzstan as a barrier to adherence with lower educated and lower socioeconomic families having challenges affording what was seen as an "appropriate diabetes diet". **[High]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023) • **Suboptimal glucose monitoring:** Patients, particularly those with type 2 diabetes, struggle to adhere to the regular blood sugar testing schedules required to safely manage insulin doses, as MAIn monitoring found the frequency of self-glucose testing was 25.7 and 3.7 times a week for people with type 1 diabetes and type 2 diabetes using insulin, respectively. For type 1 diabetes, the suggested monitoring frequency is 4–10 times per day, which equals 28–70 times per week. For type 2 diabetes with more than two insulin injections per day, the recommended frequency is 2 times per day, or 14 times per week **[Medium]** (Diabetes in Kyrgyzstan, 2024; Mayo Clinic)
		Caregiver support	• N/A

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

09

Peru

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Insulin
Global / Cross-country
Kenya
Kyrgyzstan
Peru
Tanzania
Inhaled medicines
Detailed initiatives

The following challenges were identified for insulin access in Peru (1/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Transparency	• Limited access to IT infrastructure: limited availability of information technology for health data management and a reliance on manual records, with 82% of healthcare facilities relying exclusively on paper records and only 20% having access to Wi-Fi or internet. **[Low]** (Healthcare facility readiness and availability for hypertension and type 2 diabetes care in Puno, Peru: a cross-sectional survey of healthcare facilities, 2025)
		Outreach	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (1/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Information	• **Centralized Diabetes Education:** The activities of the diabetes associations (organization or support group to improve the lives of people with diabetes and their families) in Peru were more concentrated in the capital cities. In Peru, different hospitals had their own associations with very little collaboration between them. **[Medium]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023) • **Insufficient Educational Time:** Diabetes education to patients living with diabetes as well as their family caregivers on the topic of nutrition, carb-counting and physical activity is delivered by doctors, specialized nurses, and nutritionists but limited. The education is delivered only at tertiary-level facilities (major hospitals) for T1D. Due to workloads, the time spent on this is often insufficient. **[High]** (Diabetes in Peru, 2024; Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023) • **Inadequate T1DM Information:** The information provided to insulin-dependent patients often fails to meet their specific disease management needs and unique dietary challenges. The health care system's response to individuals living with T1DM is notably deficient in terms of understanding the disease, and the information provided does not align with the unique needs and characteristics of this particular population. **[High]** (Adaptation of an mHealth Solution for the Nutritional Management of Diabetes in a Low- and Middle-Income Country: Pre-Post Mixed Methods Pilot Study, 2025) • **Lack of Educational Resources:** A survey of 605 people (either with diabetes or their relatives) found that only 33% considered that access to diabetes treatment and educational resources for patients were adequate in Peru. **[High]** (Diabetes Mellitus in Peru, 2015) • **Unstandardized Education Delivery:** Finding shows the limitations of public hospital educational programs in making patients aware of their disease. The ideal education is structured, sequential, scheduled and measurable. It is necessary for patients to understand that treatment improves their lives and delays complications, as it emphasizes the importance of diabetes education. In Peru, this aspect is still underdeveloped and there is no standardized and systematic form of application. When patients are discharged from the hospital, nurses are told to teach them how to use insulin, but this process is not structured or mandated by policy. It depends entirely on the individual health care professional. **[High]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020; Launch Event - Access to Insulin 100 Years On, 2021) • **Non-adapted Clinical Guidelines:** Clinical guidelines for the detection and management of diabetes, were available in Peru. Still, these were mainly based on international guidelines and not adapted to the local context nor widely disseminated at the PHC level. **[Medium]** (Forty years after Alma-Ata: primary health-care preparedness for chronic diseases in Mozambique, Nepal and Peru, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (2/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont.)	System	Screening	• **High Undiagnosed Rate:** The International Diabetes Federation estimates that there are 1.3 million people aged 20-79 with type 2 diabetes (5.9% of the adult population) in Peru, with 210,743 of those requiring insulin. Approximately 37.3% are currently undiagnosed. **[High]** (Diabetes in Peru, 2024) • **Inadequate Case Detection:** Peru's healthcare system does not allow for adequate detection of cases, as it is among the countries with the lowest levels of awareness, characterized by difficult access to healthcare, a weak primary healthcare system, and a lack of resources. **[High]** (Awareness, treatment, and control of diabetes in South America: A systematic review and meta-analysis, 2025) • **Limited PHC Diagnostic Capacity:** While fasting glucose tests were common, hemoglobin A1c and urine tests were all found, on average, at less than 50% of facilities, including in 22% or less of health posts in Puno, Peru. Additionally, there are fluctuating supplies of consumables for all laboratory tests. **[High]** (Healthcare facility readiness and availability for hypertension and type 2 diabetes care in Puno, Peru: a cross-sectional survey of healthcare facilities, 2025; Diabetes in Peru, 2024) • **Low Diagnostic Priority:** Low Diagnostic Priority and Delayed Diagnosis: Healthcare providers, particularly general practitioners, often lack the clinical suspicion necessary to promptly diagnose pediatric diabetes. Because diabetes is widely perceived as an adult-onset condition, non-specialist doctors frequently fail to consider Type 1 diabetes when initially evaluating a symptomatic child. Consequently, physicians may exhaust testing for other common childhood illnesses first, treating diabetes as a diagnosis of last resort. This lack of clinical awareness dangerously delays critical care; as one Peruvian caregiver observed regarding their child's diagnostic journey, general doctors "do everything, but they think about diabetes last". **[High]** (Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024)
	Patients (ability to perceive)	Awareness	• **Unaware of System Resources:** A survey of 605 people (either with diabetes or their relatives) found that 56% did not know if there is any percentage of the health budget allocated to diabetes care. **[Low]** (Diabetes Mellitus in Peru, 2015) • **Lack of Community Awareness in Schools:** The lack of community awareness and accommodating norms in settings like schools makes it unacceptable or difficult for young patients to manage their diabetes openly, leading to dangerous health events like hypoglycemia. For instance, a patient in Peru described how unsupportive school staff contributed to a crisis: "I told her: 'Teacher, tell the physical education teacher to let me eat.' She told him and he didn't let me. Then I had a crisis in the middle of the school yard. Everybody got scared. My mother came running." **[High]** (Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (3/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont.)	Patients (ability to perceive)	Beliefs	• **Blaming Insulin for Complications:** Some patients considered discontinuing treatment because they believed insulin was related to blindness, renal failure and even limb amputation; they believed these conditions were not part of the disease progression. **[Medium]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020) • **Alternative Therapy Substitution:** Patients often hold strong cultural beliefs in natural remedies, viewing them as effective replacements for insulin therapy that allow them to avoid seeking professional care. As one patient explained: "I usually take care of myself with pills and natural products like Spirulina and Ganoderma mushroom coffee. These products are equal to insulin because they control me and lower my sugar... At some point I will stop the insulin and just take the natural [product] because they do the same action." **[Medium]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020) • **Perceived Medication Diminishment Over Time:** Participants expressed their desire to stop treatment as the disease progressed, because they think the more years with diabetes, the less effect the medication has. **[Medium]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020)
		Trust	• **Health System Mistrust:** There is a feeling of mistrust by the population in the health system capacity due to suboptimal availability of medicines, lack of specialist in the public sector and the perception of discrimination or negative previous experiences in the health system among indigenous Quechua populations. **[High]** (Using government data to understand the use and availability of medicines for hypertension and diabetes lessons from Peru, 2023)
Acceptability	System	Professional values	• **Prescription Bias:** There is competition among insulin brands, where some endocrinologist and other doctors prescribe specific brands instead of others, despite government-provided, lower-cost insulin options are equally effective. **[Medium]** (Launch Event - Access to Insulin 100 Years On, 2021)
		Cultural norms	• **Non-adapted Dietary Guidance:** In Peru, the complexity of gastronomy, characterized by diverse ingredient combinations and traditional dishes, adds an additional challenge. Peruvian dishes are heavily mixed, it is incredibly difficult for patients to visually break down a meal to calculate its carbohydrate load. During the study's workshops, patients expressed a "demand for more detailed information regarding individual meal ingredients". **[Medium]** (Adaptation of an mHealth Solution for the Nutritional Management of Diabetes in a Low- and Middle-Income Country: Pre-Post Mixed Methods Pilot Study, 2025) • **Barriers to Indigenous people:** The lower likelihood of performing check-ups in the Quechua population may be due to multiple factors, including linguistic barriers, lack of resources, geographical distances to health centers, and possibly, the perception of discrimination or negative previous experiences in the health system. Additionally, cultural aspects may influence the perception of the need and utility of regular check-ups. **[High]** (Analysis of disparities in medical check-ups for patients with diabetes and hypertension: associated factors and trends in a nine-year national survey, 2026, 2026)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (4/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability (Cont.)	Patients (ability to seek)	Personal values	• **Fear of Insulin Dependence:** Patients were of the misconception that they could develop dependence or addiction, because when they stop using insulin, they experienced discomfort, and misinterpret this discomfort as a sign of addiction. **[Low]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020) • **Fear of Needles:** Most participants initially rejected insulin because it is injectable. Fear of needles has been identified as a barrier to insulin use in several studies. There is evidence that this concern tends to disappear over time. **[Medium]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020) • **Preference for Oral Meds:** Patients often find oral medications far more acceptable and comfortable to manage than insulin therapy. NOTE: For T2D, oral medicines like metformin are usually first-line treatment. Metformin lowers liver glucose output and improves insulin response, and other oral drugs can be added if needed. However, since T2D is progressive, the pancreas may gradually produce less insulin over time, making pills less effective. **[Low]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020)
		Social norms	• **Controlling and Indifferent Family Behaviors:** In Peru, controlling behaviors around T2DM self-management translated into vigilance over certain lifestyles and nagging participants to watch what they eat and be physically active. Others viewed these controlling behaviors as unhelpful and annoying. Several participants also lamented that their relatives were indifferent to their needs and often offered them (or ate) unhealthy foods in front of them. **[Low]** (Family Support and Diabetes: Patient's Experiences From a Public Hospital in Peru, 2018)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (4/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	System	Geographic location	• **Centralized Hospital Care:** Diabetes care are concentrated in the capital (Lima) and tertiary-level facilities, forcing patients in other areas to undertake significant travel. **[High]** (Diabetes in Peru, 2024) • **Specialist Geographic Inequity**: There were 17,997 specialists in Peru in 2013, of whom 300 are registered endocrinologists. Approximately 60% of specialists are practicing in the city of Lima, 20% in 5 other populous cities, and the remaining 20% in the rest of the country. **[High]** (Diabetes Mellitus in Peru, 2015) • **Limited Access to T1D Education:** Specific education and support for type 1 diabetes exists and is delivered only at tertiary-level facilities. **[Medium]** (Diabetes in Peru, 2024)
		Logistics	• **System navigation and wait-time barriers:** People face long waiting times, difficulties navigating the system for laboratory tests, accessing medicines, and accessing specialists. **[High]** (Diabetes in Peru, 2024) • **Unstructured Remote Monitoring:** Some patients live 2-3 hours from the hospital, patients sometimes require doctors to give them their telephone number, but they call constantly, making it difficult to follow these patients and track the condition of patients. Health Care Workers do not have a structured monitoring system for them. **[Low]** (Launch Event - Access to Insulin 100 Years On, 2021) • **Administrative Paperwork:** Most patient records are paper based, everything is in notebooks, not in a digital system. **[Low]** (Diabetes in Peru, 2024; Forty years after Alma-Ata: primary health-care preparedness for chronic diseases in Mozambique, Nepal and Peru, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (5/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont.)	System	Supply	• **Insulin Unavailability:** Monitoring Access to Insulin (MAIn) tool found in 2023 that unavailability (of any insulin) was 25% in the public sector and 55% in the private sector. Only 7% of pharmacies had any insulin in stock. **[High]** (Diabetes in Peru, 2024; Healthcare facility readiness and availability for hypertension and type 2 diabetes care in Puno, Peru: a cross-sectional survey of healthcare facilities, 2025) • **Inaccurate Needs Forecasting:** A key problem in insulin availability in Peru occurs during the estimation of medication requirements, the data used for estimation are based on historical consumption from previous months therefore, the requirement is underestimated. **[High]** (Surveying insulin prices, availability and affordability in Peru: Publication, 2019) • **Limited Monitoring Supplies:** There was low availability for glucose meters and test strips in both the public and private sectors. In the public sector, glucose meters were available in 4% of facilities and test strips in 21%. People had to pay for meters in the public sector, but test strips were free. In the private sector, glucose meters were found in 43% of facilities, and test strips in 38%. **[High]** (Diabetes in Peru, 2024) • **Primary Care Scarcity:** Insulin was available only in hospitals and not at the primary health care (PHC) level. Patients face challenges accessing care and medicines, especially at the primary health care level. **[High]** (Management of Type 1 Diabetes in Low- and Middle-Income Countries: Comparative Health System Assessments in Kyrgyzstan, Mali, Peru and Tanzania, 2023; Diabetes in Peru, 2024) • **Insufficient Trained Staff:** There is an insufficient number of health professionals with diabetes training. Family doctors do not manage type 1 diabetes, the management of type 1 diabetes is entrusted to endocrinologists. Peru has fewer than 0.1 endocrinologists per 10,000 population, compared with about 0.2 per 10,000 in Kyrgyzstan. **[High]** (Adaptation of an mHealth Solution for the Nutritional Management of Diabetes in a Low- and Middle-Income Country: Pre-Post Mixed Methods Pilot Study, 2025; Diabetes in Peru, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (5/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont.)	Patients (ability to reach)	Mobility	• **Geographic Terrain Barriers for Indigenous People:** The lower likelihood of performing check-ups in the Quechua population may be due to multiple factors, including geographical distances to health centers. **[High]** (Analysis of disparities in medical check-ups for patients with diabetes and hypertension: associated factors and trends in a nine-year national survey, 2026)
		Social support	• **Family Alternative Medicine Pressure:** The cultural beliefs of family members regarding alternative treatments can actively discourage patients from using their prescribed insulin, shaping how they perceive their own care needs. One patient highlighted this barrier to adherence: "My father does not want me to take insulin. He wants me to use alternative medicine." Family members play a fundamental role in supporting or rejecting the drug, and their opinions or judgments can influence the start of treatment. The beliefs and myths of patients treated with insulin arise at the beginning of treatment, remain throughout the course of treatment, and are often reinforced by the worldview of family members. **[Medium]** (Health Planning Management - 2024 - Zafra-Tanaka - Involving different stakeholders in prioritizing outcomes to assess; Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020) • **Lack of Support Network Among Poor:** Community-based support networks often fail to reach vulnerable, rural populations who lack digital access. While middle class patients in Peru can connect to care and support groups online, people who live in the more remote areas who do not have enough money to be online are on their own. **[Low]** (Launch Event - Access to Insulin 100 Years On, Video, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (6/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	System	Costs	• **High Private Sector Prices:** in the public sector, insulin is free. In the private sector the median price for 1000IU of insulin was found in facilities to be US$ 27 for human insulins, and $US 53 - US$ 71 depending on type of analogue. Households reported paying a median price of US$ 11 and US$ 56 for human and analogue insulins respectively. **[High]** (Diabetes in Peru, 2024)
		Funding	• **Low National Health Spending:** Despite Peru's progress toward universal coverage, the country's health expenditure remains below regional standards (6.2% of GDP in 2022, vs 7.9% of the region), resulting in resource constraints that disproportionately affect SIS (Comprehensive Health Insurance) facilities and the populations they serve. **[High]** (Analysis of disparities in medical check-ups for patients with diabetes and hypertension: associated factors and trends in a nine-year national survey, 2026; WHO)
		Opportunity costs	• **Limitations to Employment:** The rigorous daily demands of managing diabetes and frequently having to seek care create significant barriers for patients and their caregivers in finding and maintaining stable jobs. **[Medium]** (Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024) • **Diet-Related Isolation and Exclusion:** The differences between the diet of family members and patients reminded them during mealtimes how their condition separates them from their family. People expressed feelings of isolation and exclusion when socializing with friends and family, particularly because of the restrictive diets they need to follow for optimal T2DM self-management. **[Medium]** (Family Support and Diabetes: Patient's Experiences From a Public Hospital in Peru, 2018) • **Educational Opportunity Loss:** The anticipated financial burden of paying for insulin and related healthcare forces young patients to sacrifice their preferred higher education and future earning potential to save money. A patient shared: "I didn't go to a university I wanted to go to because I knew I would need money to pay insulin and healthcare. So I went to a not so good university that gave me an almost full scholarship." **[Medium]** (Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024)
	Patients (ability to pay)	Income & assets	• **Family Budget Exhaustion:** The combined direct costs of diabetes medications and the indirect costs of lost wages completely overwhelm the financial capacity of households, particularly those relying on a single income. As a Peruvian caregiver stated: "The biggest challenge for our family is our finance. We need money for medications and monitoring our sick son. I have to leave my job to take care of prioritizing my son and we depend on my husband to earn the livelihood of the entire family. We have one enormous financial burden." **[High]** Involving Different Stakeholders in Prioritizing Outcomes to Assess Healthcare Systems Response for Type 1 Diabetes Management: Using Co-Creation Approaches in Peru, 2024) • **Unaffordable Monitoring Devices:** Private pharmacy prices in Peru were unaffordable, requiring 3–4 days' wages to purchase 1 meter or 50 strips. **[High]** (Availability, prices and affordability of self-monitoring blood glucose devices: surveys in six low-income and middle-income countries, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (7/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont.)	Patients (ability to pay)	Health insurance	• **Lack of Insurance Coverage:** 15% of adults aged 50 and older with diabetes still have no health insurance. **[High]** (Analysis of disparities in medical check-ups for patients with diabetes and hypertension: associated factors and trends in a nine-year national survey, 2026) • **Uncovered Diabetes Technology:** Insulin pumps and continuous glucose monitoring devices are not covered by any health insurance and their use is very limited in the country. **[Medium]** (Diabetes Mellitus in Peru, 2015) • **Public Insurance Stockouts:** Despite having coverage under public systems like SIS (Comprehensive Health Insurance), stockouts mean the insurance fails to protect patients from out-of-pocket costs, forcing them to buy insulin privately. As a family caregiver noted: "Insulin is expensive, I buy it because sometimes there is none in the SIS (Comprehensive Health Insurance)." **[High]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020)
Appropriate-ness	System	Healthcare workers' knowledge	• **Inadequate Diagnostic Knowledge:** Only 48% of health care providers reported that they could diagnose T2D. **[High]** (Healthcare facility readiness and availability for hypertension and type 2 diabetes care in Puno, Peru: a cross-sectional survey of healthcare facilities, 2025)
		Coordination and continuity	• **Transition of Care Gap:** There is no continuity in care when patients reach adult age and leave pediatric care centers. **[Low]** (Diabetes in Peru, 2024) • **Fragmented Referral Barriers:** The highly divided structure of the Peruvian health system hinders continuity of care and referrals between primary care and specialized services for patients needing specialized diabetes management. **[Medium]** (Analysis of disparities in medical check-ups for patients with diabetes and hypertension: associated factors and trends in a nine-year national survey, 2026)
	Patients (ability to engage)	Empowerment / Information	• **Inadequate Dietary Knowledge:** One of the key challenges faced by people living with T1DM is understanding how to manage their meals effectively. Among children and adolescents living with T1DM and their caregivers, highlighting a perceived inadequate knowledge concerning self-management and dietary practices. **[Medium]** (Adaptation of an mHealth Solution for the Nutritional Management of Diabetes in a Low- and Middle-Income Country: Pre-Post Mixed Methods Pilot Study, 2025) • **Misconceptions of Cure:** Diabetes is a chronic disease for which there is still no definitive treatment. Treatment alternatives slow progression and reduce target organ complications. However, some patient believe that insulin could cure the disease. **[Low]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Peru (8/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont.)	Patients (ability to engage)	Adherence	• **High Non-Adherence Rates:** A descriptive study in Lambayeque, Peru with 100 people diagnosed with diabetes during 2020 using the Morinski Green test, found that the frequency of non-adherence to insulin therapy was 29%. **[High]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020, 2023) • **Supply-Driven Discontinuation:** Patients stop measuring their glucose or administering insulin as a direct consequence of unavailability of insulin syringes, glucometers, test strips and lancets for outpatients. **[High]** (Results of the Multisectoral Roundtable for Access to Medicines and Supplies for Diabetes, 2025)
		Caregiver support	• **Caregiver Administration Fear:** Caregivers often lack the confidence to physically administer insulin to their relatives, preferring oral medications out of fear of causing harm. A Peruvian family caregiver admitted: “I prefer pills because they are easier. Sometimes I am afraid to give him insulin, or that his blood will leak or he will get sick.” NOTE: For T2D, oral medicines like metformin are usually first-line treatment. Metformin lowers liver glucose output and improves insulin response, and other oral drugs can be added if needed. However, since T2D is progressive, the pancreas may gradually produce less insulin over time, making pills less effective. **[Medium]** (Myths and beliefs about insulin therapy in patients with diabetes mellitus and their family caregivers from a hospital in northern Peru, 2020, 2023) • **Caregiver Dietary Knowledge Deficit:** In a Peruvian study assessing caregivers’ perceived knowledge regarding carbohydrate counting, 53% caregivers rated their knowledge as poor or very poor, and 42% caregivers rated it as fair or good. **[High]** (Adaptation of an mHealth Solution for the Nutritional Management of Diabetes in a Low- and Middle-Income Country: Pre-Post Mixed Methods Pilot Study, 2025)

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

09

Tanzania

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Insulin
Global / Cross-country
Kenya
Kyrgyzstan
Peru
Tanzania
Inhaled medicines
Detailed initiatives

The following challenges were identified for insulin access in Tanzania (1/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Transparency	• **Unreliable Health Data:** The national Health Management Information System produces inaccurate and unreliable data on diabetes, hindering effective monitoring and policy planning. At the district hospital, the annual report recorded only 11 outpatient diabetes cases, which the facility's data provider considered inaccurate, and district reports were used mainly for planning by the council health management team, which had no specific diabetes care plans for 2012–2013. At the health center and dispensary levels, providers reported that HMIS did not include diabetes diagnoses due to limited diagnostic capacity, and a review of records found no documented diabetes cases, even at the health center where two patients had previously been treated. Similar challenges exist even in the recent years. Laboratory officers reported that while blood sugar tests are routinely conducted and the consumption of testing strips can be tracked, the DHIS2 system often fails to capture the corresponding clinical data. As a result, key indicators cannot be effectively monitored, and reports are not generated despite the availability of testing data **[Medium]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study; Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026)
		Outreach	• N/A
		Information	• **Unawareness of Entitlements:** In rural Tanzania, a lack of information regarding available health coverage exacerbates the financial burden of diabetes care. A Community Health Worker (CHW) in the Karatu District Council explicitly highlighted this barrier, stating "Insulin injections, costing up to 30,000 shillings (US $11.7) each, impose financial strain even on insured patients. Despite the government's small insurance package, a more comprehensive scheme is needed, as monthly medication demands remain high while awareness of insurance policies is limited." **[High]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (1/6)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	System	Screening	• **Undiagnosed Rural Children:** In the ongoing expansion of Tanzania's national diabetes program, assessments noted that despite efforts to decentralize care, challenges still remain, including identifying and properly diagnosing children with type 1 diabetes who fail to reach the health care facility or are misdiagnosed. Due to lack of T1D awareness, T1D symptoms among children are frequently mistaken for cerebral malaria, pneumonia, or meningitis **[Medium]** (The Development of a National Diabetes Programme in Tanzania, 2023; Type 1 diabetes care updates: Tanzania, 2015)
			• **Low Awareness and Undiagnosed Diabetes:** In rural Tanzania, over 60% of persons with diabetes in Tanzania do not know they have it, indicating weaknesses in health seeking behavior, screening and case detection **[High]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)
	Patients (ability to perceive)	Awareness	• N/A
		Beliefs	• **Misconceptions and Traditional Beliefs: Ma**ny individuals attribute diabetes to witchcraft or view insulin as a last resort, fostering reliance on traditional healers. **[Medium]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026; Insulin Users' Perspective Profile, 2017)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (2/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (cont'd)	**Patients (ability to perceive)** *(cont'd)*	**Trust**	• **Perceived Government Neglect:** Patients feel neglected by the government compared to populations with other diseases (like HIV/AIDS), causing frustration over paying out-of-pocket for public services. The government does not offer any significant support to diabetic patients (particularly financially) to provide patients with the capability to pursue the healthcare services. The clinics for instance are owned by the government but patients have to pay consultation fees each day they go there to get the services **[Medium]** (Barriers and facilitators to satisfaction with diabetes care: The perspectives of patients attending public diabetic clinics in Dar es Salaam, Tanzania, 2024)
Acceptability	**Systems**	**Professional values**	• **Physician-Dominated Care:** In rural Tanzanian health facilities, clinicians dominated patient management. For example, according to some district-hospital providers, only clinicians managed diabetes patients, and no other cadre had a role in decision making on patient care or education at the district hospital. National guidelines envision a multi-disciplinary team for diabetes care, but rural areas face severe healthcare worker shortages that make assembling these teams impossible, leaving the burden on the few available clinicians. In contrast, in cities like Dar es Salaam, nurses are actively involved and conduct teaching sessions **[Medium]** (Perceptions on diabetes care provision among health providers in rural Tanzania- a qualitative study; Barriers and facilitators to satisfaction with diabetes care: The perspectives of patients attending public diabetic clinics in Dar es Salaam, Tanzania, 2024)
		Cultural norms	• N/A
	Patients (ability to seek)	**Personal values**	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (2/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability	Patients (ability to seek)	Social norms	• **Stigma and Social Shame:** In rural Tanzania, 12% experience shame in injecting insulin in front of other people and more than 1 in 3 people perceive social stigma due to their disease **[Low]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
			• **Reliance on Traditional Healers:** In the rural Iringa district of Tanzania, an observational study evaluating therapy challenges among insulin-dependent diabetic patients found that 27% of the surveyed individuals reported the "Consultation of a traditional healer" for their condition **[Medium]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
Availability	Systems	Geographic location	• **Centralized Care:** In rural Tanzania, diabetes care is centralized at referral and district facilities, leaving lower-tier primary care facilities unequipped to manage the disease. Providers at health centers and dispensaries described their services as "pre-diagnosis," with no capacity for diagnosis or treatment, and referred suspected patients to higher-level facilities **[High]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)
		Logistics (opening hours, appointment mechanisms, etc.)	• **Inadequate Cold Storage:** In Mwanza, Tanzania, a study found quality concerns with insulin, with 2 out of 15 samples (13%) failing to meet USP assay standards, likely due to cold chain challenges during distribution. Storage at the patient level is also a constraint, as only 27% of rural patients are able to properly store insulin in a refrigerator, further affecting drug quality and effectiveness. **[High]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024; Quality of insulin obtained from hospital and community pharmacies in Mwanza Tanzania: A cross-sectional study, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (3/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability *(cont'd)*	**System** *(cont'd)*	**Logistics (opening hours, appointment mechanisms, etc.)** *(cont'd)*	• **Prolonged Wait Times:** Participants revealed the shortage of trained diabetes care specialists at the clinics, and hence it took a long time to accomplish all the services on a particular clinic appointment visit. They were subjected to long wait times before doctor's consultations due to the high patient load at the clinics and the lack of enough specialists to attend to the population on a particular clinic appointment day **[Medium]** (Barriers and facilitators to satisfaction with diabetes care: The perspectives of patients attending public diabetic clinics in Dar es Salaam, Tanzania, 2024)
		Supply	• **Stock-outs and Shortages:** In Tanzanian public health facilities, stock-outs of essential diabetes medicines are a chronic and severe barrier to care. Healthcare workers in rural Tanzania reported that stock-outs of diabetes medication and laboratory reagents were frequent, with patients at referral hospitals often having to purchase medicines from private vendors at higher costs. In public diabetic clinics in Dar es Salaam, patients similarly reported that hospital pharmacies lacked prescribed medicines, forcing them to seek external pharmacies at increased expense. A 2021 national assessment of Tanzania's insulin supply system, covering multiple regions and hospitals, highlighted the scale of the issue, finding that some regional hospitals did not receive any insulin for an entire 12-month period. According to Marketing Authorization. In facility surveys, the unavailability of insulin in the public sector was 18.9% and 27.3% in the private (pharmacies and hospitals) sectors. **[High]** (Barriers and facilitators to satisfaction with diabetes care: The perspectives of patients attending public diabetic clinics in Dar es Salaam, Tanzania, 2024; Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016; The Development of a National Diabetes Programme in Tanzania, 2023)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (3/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability *(cont'd)*	**Patients (ability to reach)**	**Mobility**	• **High Transport Costs:** In Tanzania, 61% of patients mentioned transport costs as the main problem and two-thirds (67%) of surveyed rural patients reported significant difficulty in affording the transportation costs required for their routine follow-up visits. **[High]** (COMPANY AND COMPANY-SUPPORTED PROGRAMMES WITH A COMPONENT OF DONATED INSULIN IN LOW- AND MIDDLEINCOME COUNTRIES; Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
			• **Long Travel Distances:** In rural settings, only 9% of patients take less than an hour to reach NCD clinics, while most (60.6%) take between one and two hours, with key challenges including poor roads, rain, and low availability of public transportation. **[High]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
		Social support	• **Lack of Family Understanding:** Patients frequently experience a lack of understanding from their family and the public, leading to increased anxiety, stress, and isolation. **[Medium]** (Insulin Users' Perspective Profile, 2017)
Affordability	**System**	**Costs**	• **High test strip cost:** A survey in Tanzania in 2019 also found test strips were less affordable than insulin. In the public sector, two vials of insulin and 60 test strips cost $12 and $19 respectively, while private sector prices were $16 and $21 respectively **[Medium]** (Market Report of Diabetes Self-Monitoring Devices, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (4/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability *(cont'd)*	**System** *(cont'd)*	**Funding**	• **Ageing Out of Donations:** In Tanzania's donor-supported diabetes programs, individuals with type 1 diabetes lose access to free insulin and supplies upon turning 26. They are then left with three options: purchasing human insulin out-of-pocket, enrolling in the National Health Insurance Fund (NHIF), covered in both public and selected private facilities with tiered pricing system, or joining the Community Health Fund (CHF). The CHF is the least reliable option, as insulin availability in public hospitals is inconsistent and often requires a 50% co-payment **[Medium]** (The Development of a National Diabetes Programme in Tanzania, 2023)
		Opportunity costs	• **Family Opportunity Costs:** In Tanzania, managing type 1 diabetes in children places a significant burden on households beyond direct medical costs. Evidence suggests that the ongoing financial, emotional, and time investment may be overwhelming, creating substantial economic opportunity costs for families, including impacts on other children. **[Medium]** (Company and Company-supported Programs with a Component of Donated Insulin in Low- and Middle-income Countries, 2018)
	Patients (ability to pay)	**Income & assets**	• **Unaffordable Out-of-Pocket Payments:** Some Insulin injections, costing up to 30,000 shillings each in Tanzania, impose financial strain even on insured patients, often leading to borrowing or reliance on traditional healers. Furthermore, quantitative assessments of the economic burden reveal that on average, people spent 53% of family income on one child with diabetes **[High]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026; Company and Company-supported Programs with a Component of Donated Insulin in Low- and Middle-income Countries, 2018)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (4/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability *(cont'd)*	**Patients (ability to pay)**	**Health insurance**	• **Lack of Health Insurance:** A significant portion of the population pays entirely out-of-pocket; one study noted 83% of rural patients lacked insurance. Nationally, the safety net remains incredibly sparse, the Tanzanian National Health Insurance Fund (NHIF) covers only about 8% of the population, and private insurance covers a mere 1% **[high]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024; The Development of a National Diabetes Programme in Tanzania, 2023)
Appropri-ateness	**System**	**Healthcare workers' knowledge**	• **Inadequate Provider Training:** Providers reported needing further training on diabetes care due to continuous changes in practices. While all had received pre-service training, some had only 1 day to 2 weeks of in-service training, conducted 1 to 5 years prior. Many understood the importance of personalized lifestyle interventions but felt they lacked the skills to deliver them and suggested dedicated staff for this role. Most referral- and district-hospital providers reported giving advice on diet, physical activity, medication use, and clinic attendance, despite feeling under-skilled. Providers at the same facility sometimes gave conflicting lifestyle messages, particularly on diet, including recommendations for 'special' foods that were not easily accessible. **[Medium]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)
		Coordination and continuity	• **Lack of Referral Feedback:** In rural Tanzania, primary care providers referring diabetes patients to higher-level hospitals rarely receive clinical feedback, despite its importance for coordinated and continuous care. This gap makes it difficult for providers to manage patients effectively upon their return, as they lack information on treatment provided at the referral facility **[High]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (5/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropri-ateness *(cont'd)*	**System** *(cont'd)*	**Coordination and continuity** *(cont'd)*	• **Absence of Patient Tracing:** In an assessment of rural Tanzanian health facilities, researchers found a critical gap in continuity of care, noting that both referral- and district-hospital providers said they did not trace patients who failed to return for scheduled visits **[High]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)
			• **Incoherent Patient Records:** In rural Tanzania, outpatient diabetes care relies on unstructured, patient-held paper records, with different providers documenting visits in individual notebooks containing clinical notes, lab results, prescriptions, and dispensing information. Patients are expected to bring these notebooks to each visit but may replace them if lost. The records are often brief and focused on individual visits, with little indication of a long-term care plan, limiting continuity of care **[Medium]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)
			• **Supply Chain Disconnect:** In Tanzania, integration of donated insulin into the public Medical Supplies Department (MSD) exposed major coordination gaps, as the process was insufficiently discussed with the zonal managers and the clinical pharmacists in the regional and district hospitals. This led to logistical failures, with zonal offices not having information on the allotted amounts and no clear information on donated supplies. At the facility level, this created confusion, including instances of double insulin supply, where hospitals did not differentiate between procured and donated insulin, complicating decisions on dispensing and charging, and disrupting continuous patient access **[Medium]** (The Development of a National Diabetes Programme in Tanzania, 2023)

SOURCE: In-line with text; Team analysis

The following challenges were identified for insulin access in Tanzania (5/6)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropri-ateness *(cont'd)*	**Patients (ability to engage)**	**Empowerment/ Information**	• **Weak Self-Management Support:** Education and support for self-management are very weak at all health facility levels, leaving patients poorly equipped to manage their disease. **[High]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)
			• **Dangerous Insulin Sharing:** Due to a profound lack of proper education regarding the specific mechanisms of different insulins, uninformed patients sometimes blindly exchange their prescribed insulin (e.g., swapping Actrapid for Novorapid) with friends in need; they share the medication without understanding or communicating how it works, leading to life-threatening complications and loss of life. [High] (Launch Event - Access to Insulin 100 Years On, Video, 2021)
			• **Low Health Literacy:** The complex nature of managing insulin therapy is severely hindered by low educational backgrounds; an observational study found that 69% of rural patients who missed their insulin injections multiple times a month had only up to a "Standard 1-7" education level, making comprehension of the disease and self-administration of the drug exceedingly difficult. **[High]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
			• **Dietary Misconceptions:** In rural Tanzania, limited nutritional education undermines diabetes self-management, with a "limited understanding on foods types associated with raising the glucose levels." As a result, individuals often consume foods without considering sugar or salt content, and people with diabetes lack knowledge of proper food choices, making it difficult to manage their condition effectively **[Medium]** (Stakeholders' perspectives on the management and prevention of non-communicable diseases in rural Tanzania: SWOC analysis prior to PEN Plus implementation, 2026)

SOURCE: In-line with text; Team analysis

TANZANIA

The following challenges were identified for insulin access in Tanzania (6/6)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropri-ateness *(cont'd)*	**Patients (ability to engage)** *(cont'd)*	**Adherence**	• **Inadequate Dosing Practices:** In Tanzania, 98% of children are poorly controlled, usually because of inadequate dosing to save on the cost of insulin and frequency of clinic visits, lack of parental support, irregular diet and hence fear of taking insulin. Furthermore, an observational study in the rural Iringa district found that 39% of patients in the month prior to the interview skipped insulin injection more than 5 times **[High]** (Company and Company-supported Programs with a Component of Donated Insulin in Low- and Middle-income Countries, 2018; Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
			• **Low Adherence:** A study at Bugando Medical Centre in Mwanza revealed a staggering lack of treatment consistency, with 82% of surveyed diabetic patients exhibiting overall low adherence to their prescribed insulin therapy regimens. **[High]** (Adherence to Insulin Treatment and Glycemic Control among Patients with Diabetes Attending Diabetic Clinic at Bugando Medical Centre, Mwanza, Tanzania, 2024)
			• **Complex Regimen Fatigue:** Patients managing type 2 diabetes face compounded difficulties (85% exhibiting low adherence) compared to type 1 patients, as they are often subjected to multiple concurrent drug therapies that make their daily treatment regimens highly complex and difficult to follow consistently. **[Medium]** (Adherence to Insulin Treatment and Glycemic Control among Patients with Diabetes Attending Diabetic Clinic at Bugando Medical Centre, Mwanza, Tanzania, 2024)
			• **Male Gender Non-Adherence:** A study at Bugando Medical Centre in Mwanza, Tanzania found that being male significantly reduced adherence to insulin therapy, with men nearly eight times more likely to have low adherence compared to women (OR = 7.716) **[Medium]** (Adherence to Insulin Treatment and Glycemic Control among Patients with Diabetes Attending Diabetic Clinic at Bugando Medical Centre, Mwanza, Tanzania, 2024)
			• **Hypoglycemia-Driven Avoidance:** In a study at a rural NCD clinic in Iringa, Tanzania, insulin non-adherence was common, with 39% of patients skipping injections more than 5 times per month and 46% skipping up to five times. This was largely driven by hypoglycemia concerns, as 76% of those who skipped doses reported low glucose levels (<5 mmol/L) or symptoms of hypoglycemia as the reason **[Medium]** (Management of insulin-dependent diabetes in low-resource countries: results from the chronic noncommunicable disease project in Iringa rural district of Tanzania, 2024)
		Caregiver support	• **Weak Family Self-Management Support:** In a qualitative assessment of diabetes care in rural Tanzania, researchers identified a major gap in the formal support provided to caregivers, concluding that support for self-management for patients and their families was weak at all levels **[Medium]** (Perceptions on diabetes care provision among health providers in rural Tanzania: a qualitative study, 2016)

SOURCE: In-line with text; Team analysis

The Union
International Union Against Tuberculosis and Lung Disease

09

Global / Cross-country

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
- Insulin
- **Inhaled medicines**
  - **Global / Cross-country**
  - Kenya
  - Kyrgyzstan
  - Peru
  - Tanzania

Detailed initiatives

The following challenges were identified for inhaled medicines access in Global (1/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Transparency	• **Unregulated Retail Pricing:** There is a lack of clear, transparent pricing policies for inhalers, leaving patients vulnerable to high costs, the majority of asthma and COPD medicines being unaffordable in the private sector is due to the lack of a national policy or legislation to regulate retail prices of medicines especially for chronic diseases. **[High]** (Access to affordable medicines and diagnostic tests for asthma and COPD in sub Saharan Africa: the Ugandan perspective, 2017) • **Lack of Price Transparency:** In some countries national procurement or tender prices of the mandated government institution to procure and supply medicines to all government hospitals are not publicly available **[Medium]** (Access to affordable medicines and diagnostic tests for asthma and COPD in sub Saharan Africa: the Ugandan perspective, 2017)
		Outreach	• **Absent Patient Advocacy:** Community-based efforts to mobilize, identify, and support patients are lacking due to the absence of well-resourced Asthma and COPD patient advocacy groups in LMICs is further hampering progress. **[High]** (Official Policy Brief FIRS Access to Inhaled Medicines Campaign, 2026)
		Information	• **Right Information Deficit:** A lack of clear information regarding services and care pushes patients toward dangerous alternatives, like counterfeit medication, traditional medicines, inappropriate antibiotics (with risk of drug resistance) by asthma and COPD patients to manage acute exacerbations, treatment failure and even death. **[High]** (Nigeria Case Study: FIRS Access to Inhaled Medicines Campaign, 2025) • **Poor Stakeholder Communication:** There is a lack of clear communication and information sharing regarding the care offered and needed, ineffective communication by a range of stakeholders at the local, national, regional and global levels was highlighted as a significant barrier to obtaining funding, and hence, access to medicines. **[Medium]** (Improving access to affordable quality-assured inhaled medicines in low- and middle-income countries, 2022) • **Absent Treatment Guidelines:** The health system lacks clear informational guidelines on what care should be offered, with reports showing just 22% of LMICs had national COPD guidelines which limits the availability of standardized information for both providers and patients. Essential medicines in COPD management like inhaled LAMA (either as monotherapy/in combination with LABA) were not available, this is due to their absence in the clinical guidelines and essential drug lists. **[High]** (Official Policy Brief FIRS Access to Inhaled Medicines Campaign, 2026; Access to affordable medicines and diagnostic tests for asthma and COPD in sub Saharan Africa: the Ugandan perspective, 2017) • **Limited visibility:** the numbers of patients with asthma and COPD is very significant, but those diseases are much less visible and discussed than diabetes **[Medium]** (inputs from Union team) • **Vicious cycle of recommendations:** clinical recommendations do not include inhalers because they are not available to patients in LMICs, but access to enablers has limited support because it is not included in the clinical recommendations **[Medium]** (inputs from Union team)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (1/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Screening	• **High Undiagnosed Rates:** There is a severe lack of routine checks, leaving massive populations unidentified; a study on screening-detected COPD across three LMICs found that a total of 95.3% are undiagnosed, making this a major barrier to the introduction of effective interventions. **[High]** (Unmet Diagnostic and Therapeutic Opportunities for Chronic Obstructive Pulmonary Disease in Low- and Middle-Income Countries, 2023) • **Widespread Misdiagnosis:** Children with asthma are often misdiagnosed with pneumonia and prescribed antibiotics, instead of inhaled therapies. **[High]** (Official Policy Brief FIRS Access to Inhaled Medicines Campaign, 2026) • **Diagnostic Underutilization:** Even in LMICs, where diagnosis systems like spirometry might exist, they are still substantially underused, either because they are unaffordable or because they are time-consuming in busy clinics. **[Medium]** (Asthma management in low and middle income countries- case for change, 2022) • **Absence of Active Case-Finding:** Health systems suffer from missed and misdiagnosis of asthma and COPD, driven by a lack of clinician awareness, inappropriate prescription practices, and lack of diagnostic tools (e.g., spirometers, peak flow meters). **[Medium]** (Official Policy Brief FIRS Access to Inhaled Medicines Campaign, 2026)



SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (2/7)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont'd)	Patients (ability to perceive)	Awareness	• **Lack of Community Knowledge:** The lack of community knowledge about diagnosis, treatment and outcomes for CRDs and the resultant stigma surrounding the use of inhaled medications was highlighted. **[Medium]** (Improving access to affordable quality-assured inhaled medicines in low- and middle-income countries, 2022) • **Acute Disease Perception:** Patients lack awareness of asthma as a chronic condition, believing it to be episodic, as asthma is often still regarded as an acute disease by patients in LMICs where they may consider repeated attendances at emergency facilities as the normal and inevitable consequence of being 'asthmatic'. **[High]** (Asthma management in low and middle income countries- case for change, 2022) • **Poor Symptom Recognition:** Patients fail to accurately perceive their symptom severity and need for care; a survey showed that although 60% reported their disease as well-controlled, only 8% met this criterion while 44% reported seeking acute care for asthma in the past year. **[Medium]** (Understanding and controlling asthma in Latin America: A review of recent research informed by the SCAALA program, 2023) • **Preventative Care Unawareness:** Due to historical unavailability, patients lack awareness that preventative care exists and could help them; noting that the mainstay of treatment is inhaled corticosteroids. For many years, it's not been available, so patients are not aware of it. **[High]** (Beliefs surrounding the use of inhaled asthma medication in The Gambia: a qualitative study of asthma patients and healthcare workers, 2024) • **Lack of Spacer Awareness:** Even when patients have access to inhalers, a lack of information regarding delivery devices limits treatment efficacy, particularly in children. **[Medium]** (The critical role of spacers in asthma and COPD, 2025)



Allergy Foundation of South Africa

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (2/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont'd)	Patients (ability to perceive)	Beliefs	• **Addiction and Death Fears:** Patients often hold strong misconceptions that inhalers are addictive, fearing dependence and the risk of not having access when needed. Some also share extreme beliefs, such as the idea that stopping inhaler use can lead to death. Another study highlight people's steroid phobia as well as being worried about cardiac side effects of bronchodilators and addiction to inhaled steroids. **[Medium]** (Beliefs surrounding the use of inhaled asthma medication in The Gambia- a qualitative study of asthma patients and healthcare workers, 2024; The Global Asthma Report, 2022) • **Preference for Non-Steroid and Alternative Therapies:** Personal beliefs about safety drive patients away from professional inhaler care; for example, a mother thought non-steroid medications were much safer and asked for alternatives such as traditional Chinese medicine instead of accepting an asthma diagnosis for her child. **[Medium]** (The Global Asthma Report, 2022) • **Fatalistic Health Beliefs:** In countries like Gambia, illness is seen as God's will and recovery in God's hands, reducing the perceived need for continuous clinical management. **[Medium]** (Beliefs surrounding the use of inhaled asthma medication in The Gambia- a qualitative study of asthma patients and healthcare workers, 2024)
		Trust	• **Counterfeit Medication Risks:** Financial constraints and poor access push patients toward untrustworthy and dangerous alternatives. The limited access to inhalers led to a proliferation of counterfeit and unregistered products in the Nigerian market. These substandard products pose significant health risks, including exacerbated symptoms and increased mortality. **[High]** (Nigeria Case Study FIRS Access to Inhaled Medicines Campaign, 2025)
Acceptability	Systems	Professional values	• **Generic Efficacy Concerns:** Although generic ICS and ICS–LABA inhalers are sometimes available, there are many more challenges for achieving bioequivalence with an inhaler than with tablets or capsules, because of the impact of factors such as the type of plastic and shape of the pMDI nozzle on medication delivery. Clinicians in LMICs often express concerns about a perceived lack of efficacy of generic inhalers. **[Medium]** (Asthma management in low and middle income countries- case for change, 2022) • **Availability Driven Prescribing:** Healthcare workers expressed a sense of futility and passive acceptance, noting that their prescribing practices were largely shaped by medicine availability. In the absence of inhaled therapies, they reported relying heavily on oral medications, even when these were not the preferred option. **[High]** (Beliefs surrounding the use of inhaled asthma medication in The Gambia: a qualitative study of asthma patients and healthcare workers, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (3/7)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability (Cont'd)	Systems (Cont'd)	Professional values (cont'd)	• **Physician Steroid Phobia:** Clinician attitudes can directly obstruct proper evidence-based care; Not only do many patients deny that they suffer from asthma, but also some physicians dissuade them from using their inhalers. This problem finds its roots in the people's steroid phobia as well as being worried about cardiac side effects of bronchodilators and addiction to inhaled steroids. **[High]** (The Global Asthma Report, 2022) • **Inhaler Technique Ignorance:** Provider practice norms are severely compromised because they cannot demonstrate proper use to patients; Healthcare professionals including physicians, specialist nurses, and pharmacists play a crucial role in choosing which inhaler to prescribe/dispense, and in training patients to use their inhalers correctly, and yet studies have shown that only a minority of such professionals can themselves use inhalers correctly. **[High]** (Challenges of inhaler use in the treatment of asthma and chronic obstructive pulmonary disease, 2015) • **Management Discomfort:** Over 50% of health care workers affirming that they were not comfortable diagnosing and managing respiratory conditions, even though they frequently saw respiratory patients in their facilities. **[Medium]** (Overcoming challenges of managing chronic obstructive pulmonary disease in low- and middle-income countries, 2024)
		Cultural norms	• N/A
	Patients (ability to seek)	Personal values	• **Preference for Oral Tablets:** Patients often feel more comfortable with familiar, non-inhaled alternatives, with non-adherence being directly related to preference of oral tablets and perception of greater safety of herbal medications. **[Medium]** (Challenges faced in managing adult asthma: A perspective from Asian countries, 2020) • **Device Aesthetics and Taste:** factors such as device aesthetics, medication taste, and ease of cleaning vary greatly between patients. **[Low]** (Challenges of inhaler use in the treatment of asthma and chronic obstructive pulmonary disease, 2015) • **Device Usability and Portability:** Patients strongly prefer devices that match their lifestyle and physical comfort, as surveys show patients valued the ease of use (92%) and portability (68%) of inhalers and preferred small, portable inhalers with dose counters. **[Medium]** (Inhaler sustainability in asthma and COPD care- a systematic review, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (3/7)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability (Cont'd)	Patients (ability to seek)	Social norms	• **Social Stigma:** Social stigma around asthma leads many individuals to hide their condition, often delaying treatment until symptoms become severe and difficult to manage. **[Medium]** (The Global Asthma Report 2022) • **Religious and Social Taboos:** Cultural and religious norms dictate the acceptability of treatment, as in some cultures, the use of inhaled medication may be considered impolite in public. Some pMDIs contain alcohol that may not be acceptable for religious reasons. **[Medium]** (Challenges of inhaler use in the treatment of asthma and chronic obstructive pulmonary disease, 2015) • **Marriage Prospect Concerns:** Use of inhalers has been thought to be a major barrier for marriage prospects, especially for females. **[Medium]** (Challenges faced in managing adult asthma: A perspective from Asian countries, 2020) • **Social Embarrassment and Impediment:** Patients feel societal pressure against using devices, as almost 42% of patients reported a 'feeling of embarrassment' in using their inhalers and almost half of the recruited patients felt that using or even carrying an inhaler was considered as an impediment in their social lives. **[High]** (Challenges faced in managing adult asthma: A perspective from Asian countries, 2020) • **Family Discouragement:** Family members directly influence whether a patient feels it is acceptable to use medication, as one patient shared: "when my husband asked me what did they give you, so I showed him, and he asked me not use the inhaler because I don't have breathlessness frequently." **[Medium]** (Beliefs surrounding the use of inhaled asthma medication in The Gambia: a qualitative study of asthma patients and healthcare workers, 2024) • **Peer Rejection and Isolation:** Negative peer reactions can lead to social isolation and reinforce stigma around asthma and its treatment, with patients sometimes being avoided due to visible symptoms or misconceptions about medication effects. **[Medium]** (The Global Asthma Report, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (4/7)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Systems	Geographic location	• **Urban-Rural Disparities:** Geographic location creates stark contrasts in access, as experts note that access to medicines and diagnostics differed dramatically between tertiary care, urban areas and private hospitals compared to primary care and rural health posts. Also, formal diagnosis of COPD requires spirometry, which is often limited to urban health centers. **[High]** (Improving access to affordable quality-assured inhaled medicines in low- and middle-income countries, 2022; Effectiveness-implementation of COPD case finding and self-management action plans in low- and middle-income countries- global excellence in COPD outcomes (GECo) study protocol, 2018) • **Centralized Specialized Care:** The physical location of proper diagnostic and treatment tools is misaligned with where the patients actually live, since in LMICs this [spirometry] is often only available from pulmonary physicians in specialized urban centers, while most of the burden associated with this condition occurs in rural areas. Also medicines were often more available in private facilities or hospitals that would limit the access for many people, especially those living in more remote areas. **[High]** (Effectiveness-implementation of COPD case finding and self-management action plans in low- and middle-income countries- global excellence in COPD outcomes (GECo) study protocol, 2018; The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review, 2022) • **Remote Access Limitations:** Geographic remoteness prevents patients from obtaining medicines, as systematic reviews confirm that medicines were often more available in private facilities or hospitals that would limit the access for many people, especially those living more remotely. **[Medium]** (The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (4/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Systems	Logistics	• **Supply Chain Logistics:** Poor administration makes the practical availability of medicines highly erratic, as the supply of medicines to the point of delivery to patients in many LMICs tends to be sporadic for a wide variety of reasons, issues relating to procurement, poor administration and record keeping and problems in the supply chain, particularly to remote dispensaries. **[High]** (Asthma management in low- and middle-income countries- case for change, 2022) • **Long Queues and Wait Times:** Even in countries where asthma medicines are available through functioning government-funded primary care services, patients sometime had to wait in long queues due to high demand. **[Medium]** (Asthma management in low- and middle-income countries- case for change, 2022)
		Supply	• **Diagnostic Equipment Shortage:** Essential tools to accurately diagnose and manage respiratory conditions are largely missing from health systems, as neither spirometry nor peak flow meters are widely available in LMICs. This is due to both shortage of equipment and lack of trained individuals to perform and interpret the tests, with specific studies showing Spirometry and peak flowmetry as diagnostic tests were available in 24.4% and 6.7% of the study sites respectively. **[High]** (Addressing the global challenges of chronic obstructive pulmonary disease and asthma- a shared vision from the Global Initiative for Chronic Obstructive Pulmonary Disease (GOLD) and the Global Initiative for Asthma (GINA), 2026) • **Essential Inhaler Unavailability:** Routine medication supply systematically fails to meet minimum health targets; a global review found that only six of 58 countries met the 80% availability target for short-acting beta-agonists (SABAs), three of 48 countries for inhaled corticosteroids (ICSs), and zero of four for inhaled corticosteroid–long-acting beta-agonist (ICS–LABA) combination inhalers. **[High]** (The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review, 2022) • **Trained Staff Shortages:** There is a severe lack of specialized personnel consistently available to provide care. Confirming a diagnosis of asthma or COPD may depend on referral to specialists, but their availability is low and there is also a shortage of appropriately trained health care workers at the primary health care level to be able to identify patients who present with clinical features of COPD. **[High]** (Overcoming challenges of managing chronic obstructive pulmonary disease in low- and middle-income countries, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (5/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont'd)	Systems (Cont'd)	Supply (Cont'd)	• **Spacer Device Scarcity:** The spacer, which is needed to properly administer inhaled medicines, is frequently missing from supply chains, as lack of both inhaler and spacer availability in pharmacies and hospitals has limited adoption in many countries. A Nigerian study found spacers available in just 20% of tertiary hospitals. **[High]** (The critical role of spacers in asthma and COPD, 2025) • **Pharmacy Stockouts:** A nationwide survey of asthma and COPD medicines in Nigeria conducted in 2020 across 128 pharmacies revealed that none were available in at least 80% of the surveyed pharmacies. The most frequently available medications were inhaled corticosteroids (ICS), which were available in just 16% of pharmacies and ICS, combined with long-acting beta agonist (LABA), which were available in 48% of pharmacies. Inhaled corticosteroids were not available in any public pharmacy nationwide. **[High]** (Nigeria Case Study FIRS Access to Inhaled Medicines Campaign, 2025)
	Patients (ability to seek)	Mobility	• **Prohibitive Travel Costs:** Because essential services are not located close to patients, accessing them becomes financially and logistically impossible. Confirming a diagnosis of asthma or COPD may depend on referral to specialists, but their availability is low and the cost of traveling to see them is often prohibitive. **[Medium]** (Addressing the global challenges of chronic obstructive pulmonary disease and asthma- a shared vision from the Global Initiative for Chronic Obstructive Pulmonary Disease (GOLD) and the Global Initiative for Asthma (GINA), 2026)
		Social support	• N/A
Affordability	Systems	Costs	• **Prohibitive Inhaler Prices:** The direct price of inhaled therapies consumes a massive portion of patient income, as a systematic review found SABA inhalers typically cost around 1–4 days' wages, ICSs 2–7 days, and ICS–LABAs at least 6 days. **[High]** (The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review, 2022) • **Unaffordable Diagnostic Tests:** The direct price of necessary medical tests required to properly diagnose and prescribe inhaled medications creates a severe barrier where for example the median cost of performing spirometry was 130,000 UgX (36.1 USD) in Uganda. **[High]** (Access to affordable medicines and diagnostic tests for asthma and COPD in sub–Saharan Africa- the Ugandan perspective, 2017) • **Cost-Driven Non-Adherence:** The inability to afford ongoing inhaled therapies directly prevents patients from following treatment plans, as 68.3% reported financial reason to be a barrier to proper adherence in a study. **[Medium]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (5/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	Systems	Funding	• N/A
		Opportunity costs	• **Work and Wage Disruptions:** Without access to inhaled medicines to manage their conditions, patients suffer frequent flare-ups where frequent hospital visits, lost school and workdays, forfeited wages, and reduced productivity take a high economic toll, with forecasts estimating the global economic burden from COPD alone will approach US$15 trillion due to work disruptions by 2050. **[High]** (Access to Inhaled Medicines for COPD & Asthma, 2025) • **Educational Opportunity Costs:** Children lacking proper controller medications suffer significant time away from their education due to asthma symptoms, as one study found that 33% of adolescents missed at least one school day in the previous month because of asthma. **[High]** (Official Policy Brief FIRS Access to Inhaled Medicines Campaign, 2026)
	Patients (ability to pay)	Income & assets	• **Catastrophic Health Expenditure:** The financial strain of purchasing treatments can completely deplete household assets, as in Mexico, patients spent over US$1000 out of pocket per year on COPD medicines, and in Nigeria 18% of families of children with asthma reported catastrophic health expenditure for treatment. **[High]** (The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries- a systematic review, 2022) • **Debt and Borrowing:** The lack of sufficient financial assets forces patients to incur debt simply to afford their respiratory care, with surveys showing 16% recently borrowed money for asthma treatment costs. **[Medium]** (Access to Inhaled Medicines for COPD & Asthma, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (6/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont'd)	Patients (ability to pay) (Cont'd)	Health insurance	• **Inadequate Insurance Coverage:** Even when health insurance exists, it frequently fails to fully protect patients from high treatment costs, as surveys reveal 30% of patients had medical insurance but only 17% of those had insurance that covers all treatment costs. **[High]** (Access to Inhaled Medicines for COPD & Asthma, 2025) • **Public Insurance Gaps:** Even when national insurance programs technically cover inhaled medications, systemic bottlenecks prevent actual financial relief, emphasizing that the lack of coverage and regular availability of inhaled corticosteroids in public insurance is a key bottleneck that needs to be addressed. **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026) • **Exclusion from Reimbursement:** Essential inhaled medicines are frequently excluded from national reimbursement schemes designed to help low-income populations afford care, as studies show that the same medications might be left off the National Reimbursement List, a separate list used with the essential medications list to facilitate free or subsidized cost of medications. **[High]** (Access to essential respiratory medications remains elusive in LMICs, 2022) • **Drug List Restrictions:** some insurers' Preferred Drug Lists are so limited that they only offer coverage for medication in specific devices. For example, an ICS may only be available in a Breath-Actuated Inhaler, DPI, or nebulizer combined with an LABA, as this combination may be unnecessary for some patients. **[Medium]** (Downstream Effects of Market Changes on Inhalers- Impacts on Individuals With Chronic Lung Disease, 2024) • **Lack of Pharmacy Benefits:** Individuals who cannot participate in discount programs or do not have pharmacy benefits through insurance are more likely to have poor medication adherence due to high costs. **[Medium]** (Downstream Effects of Market Changes on Inhalers- Impacts on Individuals With Chronic Lung Disease, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (6/7)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness	Systems	Healthcare workers' knowledge	• **Inapt Prescription Practices:** Evident knowledge gaps lead to poor prescribing norms, as shown in a retrospective study in Uganda which noted a high frequency of prescription of oral salbutamol (> 50%), oral prednisolone (64.2%) and oral aminophylline (16%) while Inhaled beta agonists and ICS were only used in 38% and 24% of the patients. **[High]** (Access to affordable medicines and diagnostic tests for asthma and COPD in sub Saharan Africa- the Ugandan perspective, 2017) • **Guideline Knowledge Gaps:** existing knowledge gaps among patients, physicians, and health-care professionals on current guideline directed diagnosis and treatment of asthma and COPD might also influence medication availability across LMIC. **[High]** (Access to essential respiratory medications remains elusive in LMICs, 2022) • **Low Prescription-Driven Shortages:** A knowledge gap among healthcare providers regarding treatment guidelines leads to low prescription rates for WHO-recommended inhalers, which causes pharmacies to stop stocking them because low patient demand makes it not cost-effective to store drugs. **[Medium]** (The Global Asthma Report 2022)
		Coordination and continuity	• **Fragmentary Health Services:** Some countries do not have regular access to inhaled asthma treatments due to fragmented health services, reliance on traditional medicine or private practitioners, and widespread poverty. **[High]** (Asthma management in low and middle income countries- case for change, 2022) • **Reliance on Episodic Care:** Asthma is often still regarded as an acute disease by patients in LMICs. Health services may reinforce this perception by providing widely available and relatively affordable emergency room treatment but with little or no follow-up. Patients and physicians may consider repeated attendances at emergency facilities as the normal and inevitable consequence of being "asthmatic". **[Medium]** (Asthma management in low and middle income countries- case for change, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Global (7/7)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Patients (ability to engage)	Empowerment / Information	• **Technique and Device Ignorance:** A critical lack of information and training regarding proper inhaler usage prevents patients from actively engaging in effective care. **[High]** (Inhaler devices and their challenges - Helping patients use inhalers, 2023) • **Low Public Health Literacy:** The broader inability of patients to take part in decision-making, such as identifying environmental triggers, choosing the right inhaler device, understanding the lifelong nature of their disease, or differentiating between maintenance and rescue inhalers, is due to limited public health literacy pertinent to these conditions. **[Medium]** (Availability, affordability and access to essential medications for asthma and chronic obstructive pulmonary disease in three low- and middle-income country settings, 2022) • **Symptomatic Treatment Reliance:** Patients revert to drugs giving only symptomatic relief due to lack of knowledge. **[High]** (inputs from Union team)
		Adherence	• **Widespread Erratic Adherence:** Studies reveal alarmingly high rates of non-adherence to inhaled therapies in LMICs, where poor adherence prevailed over intermediate and good adherence (80.7% vs. 12.0% and 7.3%, respectively) and deliberate and erratic non-adherence behavior patterns were the most frequent (89.7% and 88.0%). **[High]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings, 2022) • **Premature Treatment Cessation:** Patients often fail to adhere to continuous maintenance therapy once acute symptoms subside. **[Medium]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings, 2022) • **Complex Dosing Regimens:** Treatment schedules involving frequent daily use negatively impact a patient's ability to consistently adhere, as researchers note adherence was significantly higher for once-daily versus multiple dosing regimens. **[Medium]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings, 2022)
		Caregiver support	• **Caregiver Steroid Phobia:** Caregivers and parents frequently halt their children's prescribed inhaled therapies due to unfounded fears about side effects. **[Medium]** (The Global Asthma Report 2022)

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

09

Kenya

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Insulin
Inhaled medicines
Global / Cross-country
Kenya
Kyrgyzstan
Peru
Tanzania
Detailed initiatives

The following challenges were identified for inhaled medicines access in Kenya (1/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Transparency	• N/A
		Outreach	• **Minimal Community Engagement and Training:** Community health promoters (CHPs) were primarily focused on TB, maternal and child health, and HIV. Lung health activities such as asthma awareness, inhaler use, or identification of chronic respiratory symptoms were minimal. Overall, 79% of CHPs had received TB training compared with only 9% for asthma, 5% for COPD, and 3% for smoking cessation. As a result, outreach and follow-up for CRDs were minimal: fewer than 6% of facilities reported any CRD-related community engagement. **[Medium]** (Breathing Beyond TB- A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026) • **Under-resourced Community Volunteers:** Community health volunteers responsible for identifying patients face significant resource constraints that limit their outreach effectiveness. Evidence highlights that these largely unpaid workers struggle to sustain engagement due to inadequate financial, material, and training support leading to abandonment of their role. **[Medium]** (Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025; Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)
		Information	• **Fragmented Information Systems:** Information systems remain fragmented, with limited granularity for CRDs. For instance, Kenya Health Information System does not disaggregate conditions beyond TB, pneumonia, and asthma, grouping others under broad categories, which obscures the burden and outcomes of diseases such as COPD and PTLD. Respondents also noted the absence of a comprehensive and detailed reporting system. **[Medium]** (Breathing Beyond TB- A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (1/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Screening	• **Absence of Screening Tools:** Health facilities lack standardized screening algorithms for CRDs and do not consistently link patients to inhaled therapies. Respondents highlighted that, unlike TB, which had protocols in nearly all facilities, there were no screening tools available for asthma, COPD, or lung cancer. [Medium] (Breathing Beyond TB: A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026; Breathing beyond tuberculosis: a comprehensive lung health service availability and readiness assessment, 2026) • **Missed Screening Opportunities:** Symptom screening remains focused on TB, resulting in missed opportunities to identify Chronic Respiratory Disease (CRD) patients and link them to inhaled therapies. Treatment Information from Basic Unit (TIBU) data indicates that only 3% of individuals presenting with respiratory symptoms were classified as presumed TB, suggesting that a large proportion were not assessed for alternative diagnoses, including CRDs. [High] (Breathing Beyond TB: A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026)
	Patients (ability to perceive)	Awareness	• **Unaware of Hospital Waivers:** Vulnerable patients are not informed about existing financial support for treatments like inhaled medicines, as "although a hospital waiver system was in place for poor patients, it was not optimally utilized, partly because of low awareness among patients, attributed to poor linkage and communication between health facilities' frontline offices and the departments authorized to process waiver requests." [Medium] (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Acute Disease Perception:** Patients lack understanding of the chronic nature of asthma and the preventative role of controller inhalers, was identified as a barrier to medication use. Some children and parents mentioned that once the child was feeling well, they believed that there was no need to continue using the inhaler. [Medium] (Navigating childhood asthma care in Kenya: barriers identified by children and their caregivers, 2025)
		Beliefs	• **Misattribution of Symptoms:** Patients fail to recognize chronic respiratory symptoms as medical conditions that can be treated with inhaled medicines, instead attributing them to supernatural causes. Some, especially those with little education, view those infected as having been bewitched or are victims of generational curses. [High] ("People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (2/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont'd)	Patients (ability to perceive) (Cont'd)	Beliefs	• **Reliance on Traditional Remedies:** Cultural beliefs and trust in local practices can lead patients, and sometimes even community health volunteers, to prefer traditional remedies over professional care for asthma. In some cases, this means people turn to unproven treatments such as herbs, animal fat, or hot water instead of seeking inhaled medicines that are more likely to control symptoms and prevent worsening disease. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Fatalistic and Curses Beliefs:** Some people perceived chronic respiratory disease as generally untreatable, which led to low expectations that asthma could be controlled or resolved. They believed that the disease could not be treated and that the person would ultimately die from it, while others saw it as an inherited condition that lasts for life. In some communities, especially among people with limited education, asthma was also associated with supernatural explanations, with patients viewed as being bewitched or afflicted by generational curses. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022; "People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025)
		Trust	• **Loss of System Trust:** Parents' frustration with inconsistent or inappropriate care when they sought emergency treatment from general practitioners and even well-known hospitals led some to lose trust in facility-based treatment for their children's asthma. In the accounts provided, families described receiving antibiotics or cough syrup instead of inhalers, being told to change medicines in ways they felt were unhelpful, and ultimately deciding to bypass hospitals altogether in favor of a pulmonologist or a pharmacy. **[Medium]** (Navigating childhood asthma care in Kenya: barriers identified by children and their caregivers, 2025) • **Mistrust Without Diagnostic Proof:** Lack of lung function tests have negative implications on patients' trust and satisfaction in the healthcare services. That some patients challenged healthcare providers to provide proof of asthma diagnosis signals difficulties in subsequent communication, for example about treatment and management plans. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (2/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability	Systems	Professional values	• **Fear of Inhaler Dependency:** Misconceptions among healthcare workers about inhaler dependency remain a significant barrier to effective asthma management in Meru County, Kenya. Some providers incorrectly believe that inhaler use leads to addiction or lifelong reliance, discouraging patients from initiating or adhering to recommended treatment. For instance, one patient recounted being advised by a doctor to avoid inhalers entirely, with the warning that using them would result in permanent dependence and render other remedies ineffective during episodes of obstruction. **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **SABA Over-Prescription Norms:** Providers routinely over-prescribe short-acting beta-agonists (SABAs). Quantitative findings in Kenya reveal that 71.9% of patients were prescribed ≥ 3 SABA canisters, defined as over prescription" and "43.5% and 38.8% of patients were prescribed ≥ 10 canisters of SABA as monotherapy and with maintenance treatment, respectively. **[High]** (Over-prescription of short-acting β2-agonists remains a serious health concern in Kenya: results from the SABINA III study, 2023) • **Inappropriate Antibiotic Prescribing:** Despite the fact that GINA does not support the routine use of antibiotics for asthma unless there is strong evidence of lung infection, 14.1% of patients from Kenya were prescribed antibiotics for asthma. **[Medium]** (Over-prescription of short-acting β2-agonists remains a serious health concern in Kenya: results from the SABINA III study, 2023) • **Overreliance on Oral Steroids:** Some HCW preferred oral steroids e.g., prednisolone, perceived as a 'magic bullet' for lung conditions with inconclusive diagnosis. This however exposed patients to other health problems, including heart complications. **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (3/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability (Cont'd)	Systems (Cont'd)	Cultural norms	• **Lack of Privacy Accommodations:** Open spaces for drug dispensation at the pharmacies in all facilities limit audio privacy, and appropriate communication of inhaler use. Some healthcare workers observed that patients would communicate about asthma in hushed tones when receiving medication so as not to be heard. **[Medium]** ("People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025)
	Patients (ability to seek)	Personal values	• **Preference for Oral Syrups:** Patients do not understand the necessity of inhaled controller medications and wrongly perceive oral syrups as superior to inhalers for managing their symptoms. The majority felt that controller medications were not necessary and preferred bronchodilator syrups to inhalers despite having been found to have good knowledge of the disease and its management. **[High]** (Child and caregiver' perspective on barriers to Asthma management at a tertiary referral hospital in Kenya, 2024) • **Stigma of Inhaler Visibility:** Patients refuse to use inhalers and spacers because they do not want to be visibly identified in their community as having a stigmatized disease. In Kenya, health workers reported patients were reluctant to use spacers as well as inhalers, which particularly affected management of children and presented barriers to demonstration of inhaler use. Some healthcare workers observed that patients would communicate about asthma in hushed tones when receiving medication so as not to be heard. **[High]** ("People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025) • **Expectation of Acute Cure:** Patients often expect asthma treatment to provide a quick, complete cure rather than long-term control, so being told to continue inhaler therapy can feel discouraging. In the quote, patients who felt better expected healthcare workers to stop the medication, and they were disappointed when advised to keep taking it for the long term because they saw that as burdensome. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Expectation of Uniform Treatment:** HCW narratives showed that patients' expectations and assumptions created barriers to individualized treatment plans, particularly when they demanded a specific treatment. For example, some asthmatic patients expected to receive the same treatment as someone they knew, without understanding that asthma exists on a spectrum. **[Low]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (3/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability (Cont'd)	**Patients (ability to seek)**	**Social norms**	• **Diagnosis Denial:** Diagnosis denial driven by stigma leads patients to conceal symptoms and resist both diagnosis and treatment. Patients often reject an asthma diagnosis due to its negative social perceptions, which in turn reduces their willingness to accept recommended therapies, including inhalers. **[Medium]** ("People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025) • **Social Isolation:** Community stigma and fear of contagion can make asthma patients socially isolated, hide symptoms, and avoid using inhalers in public. In one account, neighbors would not even serve tea because they believed asthma could spread like TB, while other quotes show that asthma was seen as a lifelong defect that damaged marriage prospects and led to rejection or regret after disclosure. A concise heading for this theme could be asthma stigma and fear of contagion. **[Medium]** ("People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025; Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)
Availability	**Systems**	**Geographic location**	• **Distance for Poorest:** The poorest patients face greater geographical barriers, living significantly farther from health facilities, averaging 8.1 km away compared to 5.2 km for the least poor, which limits their access. **[Medium]** (Equity in access to non-communicable disease medicines: a cross-sectional study in Kenya, 2018) • **Long Distances to Specialists:** Patients were frequently referred to facilities that had medical doctors or consultant physicians. These facilities are located further away from patients' areas of residence, exposing them to increased out-of-pocket travel costs and lost income and productivity. **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (4/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont'd)	Systems (Cont'd)	Logistics	• **Long Clinic Waiting Times:** Long clinic wait times can undermine patient satisfaction and adherence, especially in chronic care where repeated visits are needed. Healthcare workers described being under constant pressure from long queues, which sometimes led them to focus mainly on prescribing medicines and speeding patients through attendance and discharge rather than delivering more comprehensive care. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022; Navigating childhood asthma care in Kenya: barriers identified by children and their caregivers, 2025) • **No Dedicated Asthma Clinics:** Asthma services were poorly organized compared with other chronic disease clinics, such as those for diabetes and hypertension, which had regular medical outpatient appointments. Healthcare workers noted that dedicated clinics for chest conditions were rarely booked, and asthma patients were often managed like any other general patient, required to join the same queue and not given special attention. **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)



SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (4/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont'd)	Systems (Cont'd)	Supply	• **Frequent stock-outs reduce demand:** Healthcare workers reported the frequent unavailability of prescribed drugs and inhalers at the facilities had an adverse impact on their demand by patients. A HCW observed that some patients, accustomed to frequent stock outs, purchased directly from private retailers, and may not be aware of subsequent drugs availability, e.g., new deliveries at the health facilities. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Lack of Diagnostic Testing:** The absence of routine lung function testing prevents the identification and confirmation of asthma and COPD cases. Only 10% of facilities had functional spirometers, 79% of which were in Nairobi, 6% had peak flow meters, 16% had nebulizers, and 77% had pulse oximeters. **[High]** (Breathing Beyond TB- A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026) • **High Inhaler Stockouts:** Availability of inhaled medicines was limited across facilities, with salbutamol inhalers reported as the most commonly available option in only 39% of facilities, while inhaled corticosteroids (ICS) were available in fewer than 20%. Stock-outs were frequently reported, particularly for inhalers in public-sector and rural facilities, highlighting persistent gaps in essential asthma medicine access. **[High]** (Breathing Beyond TB- A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026) • **Inconsistent Central Supply:** Some healthcare workers and key informants perceived Kenya Medical Supplies Authority (KEMSA) to have inadequate capacity to supply all 47 counties. They also reported that drug orders were handled on a first come, first served basis, meaning KEMSA stocks could run out before a county's order was processed. In addition, poor communication with health facilities about which drugs could be ordered through KEMSA created delays; if an order was invalid, it might only be corrected in the next quarterly supply cycle, causing stock-outs to last 3–6 months. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Severe Specialist Shortages:** Human resource capacity for lung health is critically constrained. Fewer than 35 pulmonologists serve the entire country, and shortages of specialists have been reported across all 47 counties, with deficits ranging from 62% to 85% relative to staffing norms. **[High]** (Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (5/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability (Cont'd)	Patients (ability to reach)	Mobility	• **High Travel Costs:** The poorest patients may also be unable to afford the cost of travelling to more distant private outlets where medicines are more likely to be in stock or more distant public or non-profit health facilities where medicines may be available at a lower price or free of charge. **[Medium]** (Equity in access to non-communicable disease medicines: a cross-sectional study in Kenya, 2018) • **Impassable Rainy Season Roads:** Poor road networks were reported by 52% of participants in a study, particularly during the rainy season when even motorcycles struggled to use the roads. As a result, some patients had to postpone clinic visits until conditions improved, which disrupted access to medicines and negatively affected adherence because they went without treatment for several days. **[Medium]** (Accessibility of essential medicines for non-communicable diseases in a developed system of government in trans Nzoia county, Kenya, 2020) • **Lack of Motorized Transport:** Walking was the main means of reaching the health facility for 47% of participants in a study, while patients in remote areas often struggled to find transport when needed. In some cases, this forced them to rely on alternatives such as donkey carts to access care. **[Medium]** (Accessibility of essential medicines for non-communicable diseases in a developed system of government in trans Nzoia county, Kenya, 2020)
		Social support	• **Lack of School Support:** Community resources and policies were found to be inadequate, particularly in supporting children in school or under the care of extended family. Participants described scenarios where people thought children were pretending to have exacerbations or felt uncomfortable using inhalers in front of others due to stigma. **[High]** (Navigating childhood asthma care in Kenya: barriers identified by children and their caregivers, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (5/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	Systems	Costs	• **Unaffordable Market Inhalers:** Inhaled corticosteroids (ICS) were reportedly supplied at hospital level at a subsidized cost of 200 Kenya shillings (about 1.7 USD), compared with a market price of 1,500–2,500 Kenya shillings (about 13–21.5 USD). However, in a study in one primary healthcare facility, ICS were excluded from the drug requisition spreadsheet, which meant patients had to buy them from private retailers instead. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **High Diagnostic Imaging Costs:** High out-of-pocket costs for essential diagnostic imaging like chest X-rays (Ksh 400–1,000) (USD 3.0 – 7.52) and CT scans (Ksh 7,500) (USD 64.4), which are required for proper respiratory diagnosis to inform inhaler treatment. **[High]** (Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025; Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)
		Funding	• **Skewed Budgeting:** Financing for lung health services in Kenya remains heavily skewed toward TB. TB diagnostics and medicines are consistently provided free of charge, while CRD services, including inhalers and other essential medicines, are inconsistently covered, leaving many patients to pay out of pocket. Kenya has a mixed health financing system made up of government funding at 47%, donors at 18%, out-of-pocket spending at 24%, and private financing at 11%. In FY 2023/24, the health sector budget was Ksh 140 billion (USD 1.052 billion), with Ksh 2.3 billion (USD 17.3 million) allocated to TB through the Global Fund, but no national budget line for asthma, COPD, or lung cancer. Counties routinely fund TB programs but rarely allocate comparable resources to other CRDs. **[High]** (Breathing Beyond TB- A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026; Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025)
		Opportunity costs	• **High Lost Income:** Patients seeking care for chronic respiratory diseases lost an average of 1.7 days of work, and lost income accounted for 23.3% of the total cost of care. In the study, the mean total cost was KES 1,062 (95% CI 896–1,228; US$9.1), of which 40.0% was direct non-medical costs (KES 425), 36.7% was direct out-of-pocket medical costs (KES 390), and 23.3% was lost income (KES 247). **[Medium]** (Catastrophic health expenditure, social protection coverage, and financial coping strategies in adults with symptoms of chronic respiratory diseases in Kenya: a cross-sectional study, 2025)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (6/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont'd)	Patients (ability to pay)	Income & assets	• **Catastrophic Medical Costs:** Seeking care for CRD symptoms places a severe economic burden on patients. In a study of 296 patients in Meru County, more than half experienced "catastrophic costs,". When comparing the patients who suffered these catastrophic costs against the patients who did not, the catastrophically affected group experienced much higher lost income (KES 315, USD 2.7 vs KES 102, USD 1) and incurred steeper direct medical costs for medicines (KES 92, USD 0.8 vs KES 51, USD 0.4), radiography (KES 116, USD 1 vs KES 79, USD 0.7), and laboratory tests (KES 170, USD 1.5 vs KES 88, USD 0.8) (note: the source does not explain the reasons behind the difference in cost magnitude among patients). **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Savings Depletion and Borrowing:** Due to low individual and household financial capacity, patients lack buffers and must resort to spending their savings or borrow to cover the costs of respiratory care. In a study, the mean monthly participant income was KES 4,684 (about US$40), and the main strategies used to pay for care-seeking were using savings and borrowing money. Specifically, 173 of 296 participants (58%) relied on savings, while 91 of 296 (31%) borrowed money to cover costs related to chronic respiratory disease symptoms. **[Medium]** (Catastrophic health expenditure, social protection coverage, and financial coping strategies in adults with symptoms of chronic respiratory diseases in Kenya: a cross-sectional study, 2025)



SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (6/8)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont'd)	Patients (ability to pay)	Health insurance	• **Unawareness of NHIF Eligibility:** Patients lack clear information on insurance that could cover inhalers, with studies noting little information and awareness, including about NHIF eligibility and processes were cited as the main barriers to NHIF membership and usage. A study says that unawareness of eligibility (26%) and inadequate information (21%) restricted enrollment. **[High]** (Catastrophic health expenditure, social protection coverage, and financial coping strategies in adults with symptoms of chronic respiratory diseases in Kenya: a cross-sectional study, 2025; Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Low Insurance Penetration:** In Kenya, 82% of women and 79% of men do not have health insurance. Voluntary membership in the NHIF cost KES 500 per month (about US$3.9), and although family cover was available at different rates, this still amounted to roughly 10% of the mean monthly individual income of KES 4,684 (about US$40) among the study participants, making it unaffordable for many people. **[High]** (Access to medicines for asthma, diabetes and hypertension in eight counties of Kenya; Catastrophic health expenditure, social protection coverage, and financial coping strategies in adults with symptoms of chronic respiratory diseases in Kenya: a cross-sectional study, 2025) • **Low Insurance Utilization:** In a study of those covered by NHIF, 73 out of 84 (87%) did not use it to pay for chronic respiratory disease care. The main reasons were that they were not asked about NHIF (30/73; 41%), were not up to date with premium payments (22/73; 30%), or the healthcare facility did not accept NHIF cards (16/73; 22%). **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Ambiguous CRD Coverage:** The Social Health Authority's primary care package covers screening and diagnosis for all diseases at Ksh 900 (USD 6.75) per patient annually, but the Emergency Chronic and Critical Illness Fund does not specify CRD coverage. **[Medium]** (Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025)
Appropriate-ness	Systems	Healthcare workers' knowledge	• **Weak Dissemination of Treatment Guideline:** Standard processes of communicating guidelines from national policy level to service delivery levels were felt to be inadequate; for example, healthcare workers in Kenya described learning about asthma management guidelines incidentally. There was limited awareness of treatment guideline updates with many clinicians still prescribing available oral salbutamol instead of inhalers, despite lack of evidence for efficacy. **[Medium]** (What are the barriers to the diagnosis and management of chronic respiratory disease in sub-Saharan Africa? A qualitative study with healthcare workers, national and regional policy stakeholders in five countries, 2022)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (7/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Systems (Cont'd)	Healthcare workers' knowledge (Cont'd)	• **Insufficient Guideline Training:** Healthcare workers had limited training on asthma guidelines, leaving them less prepared to manage chronic respiratory diseases than TB. As the study notes, skills in CRD diagnosis and management were limited across cadres, and while 68% of facilities had at least one healthcare worker trained on the Integrated TB guidelines, only 51% had staff trained on asthma guidelines. **[High]** (Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025) • **Incorrect Diagnosis and Treatment:** Although most healthcare workers reported confidence in diagnosing asthma from clinical symptoms and patient history, interview narratives suggested that some diagnoses were still incorrect. In these cases, misdiagnosis led to inappropriate treatment decisions, including repeated prescriptions of TB treatment for people who actually had asthma or other persistent chronic respiratory symptoms. **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Inability to Use Inhalers:** Some healthcare workers may not know how to use inhalers correctly, which has negative implications for patient education and effective treatment monitoring. As one participant in a study noted, "If a healthcare worker does not know how to use it (inhaler), then you don't expect patients to get anything." **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)



SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (7/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Systems (Cont'd)	Coordination and continuity	• **Poor Community-Facility Linkage:** The community health system showed weak linkage with health facilities, along with poor communication, limited coordination, and little follow-up for referred patients with asthma. In particular, poor working relations between community health volunteers and formal healthcare workers made it difficult to track, support, and continue care for people with chronic respiratory disease after referral. **[High]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022) • **Fragmented Patient Records:** TB registers were available in 95% of facilities, while asthma and COPD registers were present in only 6% and 5%, respectively. In addition, the Kenya Health Information System did not disaggregate chronic respiratory diseases beyond TB, pneumonia, and asthma, making it impossible to track COPD or PTLD burden or outcomes. **[High]** (Breathing Beyond TB- A Comprehensive Assessment of Lung Health Service Readiness and Critical Gaps Across Kenya's Healthcare System, 2024, 2026) • **CRD Care Remains Concentrated in Tertiary Hospitals:** Disconnected CRD Services: CRD services are largely confined to tertiary hospitals where chest clinics provide only limited diagnostic capacity. **[Medium]** (Breath of a Nation- Chronic Lung Diseases and their Hidden Burden in Kenya, 2025) • **Delayed Clinical Reviews:** Patients who should have been reviewed within two weeks based on the doctor's assessment of severity were instead scheduled for a follow-up in four months. This mismatch between clinical judgment and actual review timing suggests gaps in continuity of care. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)
	Patients (ability to engage)	Empowerment / Information	• **Low Trigger Awareness:** Inadequate understanding of asthma triggers and causes can undermine optimal, holistic asthma care. In a study from Western Kenya, although participants could identify some triggers, most were unable to recognize that emotional stress, exercise, cockroaches, and aspirin or ibuprofen could also provoke asthmatic attack. **[High]** (Navigating childhood asthma care in Kenya: barriers identified by children and their caregivers, 2025; Child and caregiver' perspective on barriers to Asthma management, 2024)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kenya (8/8)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Patients (ability to engage) (Cont'd)	Adherence	• **Child and Adolescent Inhaler Adherence:** Some children disliked the inhaler, and parents said this reluctance made it difficult to administer the medication consistently. Among adolescents, forgetting doses was also common, often because of busy school schedules or the absence of symptoms. **[High]** (Navigating childhood asthma care in Kenya: barriers identified by children and their caregivers, 2025) • **Symptom-Driven Non-Adherence:** HCW reported that many patients did not adhere to the asthma treatment plans. For example, some stopped using the inhalers or other asthma medication as soon as they felt better. **[Medium]** (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?, 2022)
		Caregiver support	• **Spousal and Family Rejection:** The severe financial burden of paying out-of-pocket for asthma medicines, combined with deep stigma around the disease, can strain family relationships and even lead to a spouse's resentment or abandonment. In the quoted account, the patient describes how repeated expenses for treatment left the household unable to meet basic needs such as rent, forced a move back to a rural home, and intensified blame from the husband's family, who viewed asthma as untreatable. The patient also explains that this social and economic pressure eroded self-esteem and contributed to her husband later regretting the marriage after learning about her condition. **[High]** ("People here live in denial": A qualitative study of the pervasive impact of stigma on asthma diagnosis and care in Kenya and Sudan, 2025)



Allergy Foundation of South Africa

SOURCE: In-line with text; Team analysis

The Union
International Union Against Tuberculosis and Lung Disease

09

Kyrgyzstan

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Insulin
Inhaled medicines
Global / Cross-country
Kenya
Kyrgyzstan
Peru
Tanzania
Detailed initiatives

The following challenges were identified for inhaled medicines access in Kyrgyzstan (1/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Transparency	• N/A
		Outreach	• **Tuberculosis Focused Outreach:** Community health outreach fails to actively identify patients who require inhaled medicines because local health campaigns in Kyrgyzstan appear to emphasize infectious diseases such as tuberculosis more than chronic conditions like CLD. This has led to insufficiently effective health education campaigns for improving knowledge of CLD **[Medium]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025) • **Ineffective Prevention Outreach:** Anti-smoking efforts were being carried out in schools and communities through brochures, posters, lectures, films, and seminars on the harms of smoking and naswar. However, despite these activities, tobacco control remained weak, particularly in relation to youth access **[Medium]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025)
		Information	• N/A
		Screening	• **Widescale Underdiagnosis for COPD:** There is a severe lack of diagnostic equipment and there is low awareness and limited training of medical workers, as Kyrgyzstan faces a widescale underdiagnosis of COPD which may be attributed to poor awareness about COPD and its risk factors among communities and health-care workers, and lack of spirometers and skills to interpret spirometry in health centers **[High]** (Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study, 2021) • **Widescale Underdiagnosis for Asthma:** Despite high prevalence, screening systems fail to identify asthma cases to prescribe inhalers, as none of the children under the age of 5 in a study with long-term and/or recurrent cough and respiratory distress were diagnosed with asthma, despite a prior Kyrgyz study which found a prevalence of 12.2% among 6–7 year old Kyrgyz schoolchildren **[High]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (1/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Patients (ability to perceive)	Awareness	• **Low Public Awareness of Chronic Lung Disease and related services:** The public lacks visibility into available chronic respiratory services and treatments due to poor health education. The term COPD was unfamiliar to many community members, and knowledge about asthma symptoms was often inaccurate, indicating an absence of targeted health education and promotion on chronic lung diseases. Additionally caregivers described their child's respiratory illness using phrases such as severe cough, noisy breathing, loud breathing, and whistling breathing, but were unfamiliar with the terms wheeze and viral wheeze (CLD) [Medium] (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025; Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019) • **Normalization of Symptoms:** Contributing chronic lung diseases (CLD) condition may be linked cold and weather might be because of the distinctive geography and climate in Kyrgyzstan, as long-term residence at high altitude and low temperature exposure can affect pulmonary function, producing symptoms similar to CLD. This may lead local people to normalize coughing and shortness of breath, therefore obscuring the recognition of CLD [Medium] (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025) • **Inability to Differentiate Diseases:** Key informants in a study with in-depth knowledge or an overall overview of community beliefs, perceptions and behaviors also struggled to distinguish between different respiratory illnesses, often grouping them all under a single broad category of "lung disease." This lack of differentiation reflects a broader tendency to collapse varied respiratory conditions into one general illness label, which can obscure understanding of specific diseases and their treatment needs [High] (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025)
		Beliefs	• **Fear of Inhaler Addiction:** Caregivers often misunderstand inhaled treatment and reject it because they fear the medications are dangerous. Healthcare professionals noted that parents think inhalers are mainly used by adults with severe disease, and they worry that use in young children could lead to addiction [High] (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (2/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability (Cont'd)	Patients (ability to perceive) (Cont'd)	Beliefs	• **Reliance on Traditional Remedies:** In both the highlands and lowlands, traditional remedies were frequently mentioned as a way of relieving early respiratory symptoms, such as cough and sore throat, by applying drinks or food mixed with animal fat, meat, milk, and herbs **[Medium]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025) • **Normalization of Illness and Low Care-Seeking:** Participant in a study explained that people mostly rely on self-treatment and seek help from health services only when a case becomes very serious. They noted that they had not seen people going to the hospital on a large scale, describing their community as a nomad nation that traditionally herded cattle and rarely saw doctors. Instead, it was common to drink hot tea or sheep fat as treatment, following ancestral practices without consulting doctors. Over time, people have become accustomed to this approach and believe that illnesses will pass by themselves **[Medium]** (Mapping low-resource contexts to prepare for lung health interventions in four countries (FRESH AIR): a mixed-method study; Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025) • **Stigma of Family Neglect:** A few caregivers believed that a child with asthma is a consequence of neglect by the family, or due to complications at birth **[Low]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019)
		Trust	• **Distrust of State Healthcare:** Caregivers reported that doctors at state hospitals did not treat patients well and sometimes made wrong diagnoses, whereas private hospitals were seen as providing better care for those who could afford them. Those without the means to pay turned to state hospitals by necessity, with many going there despite their concerns. Some caregivers bypassed local health centers and went directly to hospitals because of previous fruitless visits, and they complained about incorrect diagnoses and ineffective medicines **[Low]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025; Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan: overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study, 2018)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (2/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability	Systems	Professional values	• **Limited Clinical Follow-up and Home Treatment:** Health professionals reported that although they had never diagnosed asthma in children under 5 years, they used bronchodilators such as inhaled salbutamol acutely for shortness of breath in the clinic and found them effective. Some also administered theophylline and Euphyllin tablets, Atrovent (an anticholinergic drug), and dexamethasone (intramuscular steroids), but neither inhaled bronchodilators nor inhaled corticosteroids were prescribed for subsequent use at home **[Medium]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019) • **Protective Diagnostic Avoidance:** Some health professionals asserted that they would hesitate to diagnose a child with asthma because they did not believe it to be asthma, and also to protect the family, because, the diagnosis of asthma would be a shock for the families and stress them. **[High]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019) • **Antibiotic Prescribing Culture:** Broad-spectrum antibiotics and supportive medicine were used repeatedly, prescribed by health professionals or purchased un-prescribed by the caregivers at the pharmacy **[High]** (Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan: overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study, 2018)
		Cultural norms	• N/A
	Patients (ability to seek)	Personal values	• N/A
		Social norms	• **Societal Handicap Beliefs:** The community views asthma as a permanently debilitating condition, creating a social norm where an asthma diagnosis and the required inhaler treatments are seen as a lifelong disability, as in the health professionals' experience, it was a belief in society that children would be handicapped and would be unable to live a normal life **[High]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019; Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan: overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study, 2018)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (3/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Systems	Geographic location	• **High Provider Workloads:** There is one doctor and one nurse per village. As there is no equipment in the villages, severe and unclear patients are referred to central district hospitals, where one doctor serves up to 20–30 patients per day, which can also affect the quality of medical care. It is important to note that there is a large shortage of primary health care workers, especially in more remote Kyrgyz regions, and due to the heavy workload of physicians, they physically do not have time or forget to evaluate or support patients' adherence **[High]** (Prevalence and Economic Burden of Respiratory Diseases in Central Asia and Russia: A Systematic Review; Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings, 2020) • **Pharmacy Access Gaps:** Limited geographic distribution of subsidized pharmacies contributes to gaps in asthma medication access, as most such pharmacies are located only in regional centers. As a result, around 15% of doctor-written prescriptions for patients with bronchial asthma remain unfilled, either because the required medicines are unavailable in the pharmacy network or because an accessible pharmacy cannot be found **[Medium]** (Assessment of the PHC service delivery to the population with specific conditions within the frames of the State Guaranteed Benefits Package, 2024)
		Logistics	• **Inconvenient Operating Hours:** Patients experience acute respiratory symptoms such as severe coughing at times when medical facilities are physically inaccessible, directly hindering their ability to receive timely care, as caregivers noted that usually the cough reaches its peak at nights or early in the morning, when the local health posts are closed **[Medium]** (Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan- overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (3/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Systems	Supply	• **Frequent Stock-Outs:** Of all patients that visited the hospital, almost half reported that medication was not available. For the pharmacy, this was the case in 8%. Additionally, lack of supply of inhaled preventer medicines at clinics acts as a systemic barrier that discourages providers from even making an asthma diagnosis in young children **[Medium]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings; Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019) • **ICS Availability Gaps:** Inhaled corticosteroids (ICS) were only available for sale in Kyrgyz capital Bishkek and not in other regions. From the group of bronchodilators, only salbutamol and astalin were available all throughout Kyrgyzstan **[High]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings) • **Limited Long-Acting Bronchodilators:** Scarcity of appropriate long-acting inhalers forces patients to incorrectly use short-acting relievers for maintenance, as in Kyrgyzstan, limited availability and affordability of long-acting bronchodilators contribute to frequent use of SABA/SAMA as de-facto maintenance therapy, despite inconsistency with GOLD recommendations **[High]** (Usability of the test of adherence to inhalers toolkit to patients with COPD in Kyrgyzstan) • **Scarcity of Diagnostic Equipment:** A systemic lack of equipment supplies like spirometers prevents accurate staging and prescribing of inhaled medications, leads to the high number of severe COPD in Kyrgyzstan **[High]** (Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study, 2021)
	Patients (ability to reach)	Mobility	• **Geographic and Climatic Barriers to Access:** Patients in highland regions face severe transport shortages preventing them from reaching clinics to obtain respiratory care and medicines, explaining there is no connection, no gasoline, no car and they ride to the border post on horses and get there by car. Additionally extreme climatic conditions in mountainous areas physically block roads as snow becomes at the same level with human height **[High]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025; Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan- overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study) • **Long Travel Distances:** Geographic isolation of highlands severely restricts patients' ability to purchase needed respiratory treatments, as medical facilities and pharmacies are situated far away, with community members noting it is 25 km to the nearest drugstore. **[High]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025)
		Social support	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (4/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	Systems	Costs	• N/A
		Funding	• N/A
		Opportunity costs	• **Labor Productivity Losses:** Labor productivity losses pose a critical access challenge in COPD care in Kyrgyzstan, as patients' poor health and reduced ability to work limit their capacity to afford and consistently access essential diagnostics and inhaler treatments, extending the economic burden beyond direct out-of-pocket costs **[Medium]** (Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study)
	Patients (ability to pay)	Income & assets	• **Unaffordable Maintenance Therapies:** Economic constraints significantly limit access to appropriate COPD treatment, with only bronchodilators remaining relatively affordable for most patients. In contrast, inhaled corticosteroids (ICS) and fixed-dose combination therapies are largely unaffordable, restricting the use of guideline-recommended regimens. As a result, 68.3% of patients reported financial barriers as a key factor affecting proper treatment adherence **[High]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings) • **Costly Private Diagnostics and Treatment:** Up to 71.5% of COPD patients from a study had to pay a fairly large amount of money due to the absent, non-working or outdated devices in public medical centers. Therefore, they have to turn to private diagnostic centers, which have to be paid for by patients themselves, regardless of whether they have insurance. It can be due to the lack of many diagnostic tests in primary health-care centers (PHC), and patients had to go to private diagnostic centers for a certain fee. Notably, 71.5% of the interviewed patients had to pay their medications themselves and 64.4% paid for their diagnostics **[High]** (Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study) • **Inadequate Caregiver Provision:** Health professionals report that caregiver fails to support young children with respiratory illnesses due to a lack of education and economic means, resulting in caregivers often postponing the consultations or for not buying the recommended medicine. **[Medium]** (Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan- overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (4/5)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	Patients (ability to pay)	Health insurance	• **Lack of Full Coverage:** Only 3.0% of patients reported that their medications were fully covered by insurance, while 28.1% had partial coverage. As a result, more than 95% of patients were required to purchase medications either entirely out-of-pocket or through co-payments. This lack of comprehensive coverage exacerbates affordability challenges and undermines consistent access to essential treatments **[High]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings) • **High Out-of-Pocket Cost:** High out-of-pocket expenditure places a substantial financial burden on patients with chronic respiratory conditions. The mean total annual per-patient cost of care was $331.5 (median: $103.5), comprising $107 in government-reimbursed services and $224 in patient co-payments. Overall, co-payments alone accounted for approximately one-fifth of the annual income of patients with COPD in Kyrgyzstan. Reimbursement for COPD medications can be either full or partial, with several commonly used treatments such as salbutamol, ipratropium bromide, and inhaled corticosteroids (ICS) reimbursed at 50% **[High]** (Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study)
Appropriate-ness	Systems	Healthcare workers' knowledge	• **Non-Adherence to Guidelines:** Medical staff at the primary healthcare level fail to prescribe treatments aligned with modern Global Initiative for Asthma (GINA) recommendations, leading to a situation where patients do not receive appropriate management or recommended inhaled therapies. For example, Treatment was dominated by monotherapy (mostly SABA) across all GOLD severity categories at 68–91%, implying systematic under-prescription of guideline-recommended controller therapy **[Medium]** (ANALYSIS OF PHARMACOTHERAPY OF PATIENTS WITH BRONCHIAL ASTHMA AT THE PRIMARY LEVEL OF HEALTHCARE IN BISHKEK CITY, KYRGYZ REPUBLIC; Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study, 2021)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (5/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Systems (Cont'd)	Healthcare workers' knowledge (Cont'd)	• **Poor awareness and Training Among Health Workers:** The apparent underdiagnosis of asthma in rural Kyrgyzstan seemed to reinforce itself over time, shaped by entrenched misconceptions, outdated diagnostic criteria, and long-standing traditions that left no room for asthma diagnoses in children under five. As a result, few children were labeled as having asthma, and health professionals often filled this diagnostic gap by attributing symptoms to infections such as bronchitis, pneumonia, or viral illness, frequently prescribing antibiotics instead. Additionally, lack of awareness and limited training of medical workers about COPD leads to the high number of severe COPD in Kyrgyzstan **[High]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019; Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study, 2021) • **Limited Clinical Follow-up and Home Treatment:** Health professionals reported that although they had never diagnosed asthma in children under 5 years, they used bronchodilators such as inhaled salbutamol acutely for shortness of breath in the clinic and found them effective. Some also administered theophylline and Euphyllin tablets, Atrovent (an anticholinergic drug), and dexamethasone (intramuscular steroids), but neither inhaled bronchodilators nor inhaled corticosteroids were prescribed for subsequent use at home. **[Medium]** (Asthma in Children Under 5 Years in Rural Kyrgyzstan: A Diagnostic Vacuum? a Qualitative FRESH AIR Study, 2019)
		Coordination and continuity	• **Bypassing Primary Care:** Due to prior fruitless visits and diagnostic inconsistencies at local health centers, caregivers frequently bypass primary care entirely, going directly to pharmacies, provincial, or national hospitals to shortcut the treatment process, which severely disrupts the intended referral network and continuity of care **[Medium]** (Recurrent lower respiratory illnesses among young children in rural Kyrgyzstan: overuse of antibiotics and possible under-diagnosis of asthma. A qualitative FRESH AIR study, 2018)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Kyrgyzstan (5/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Patients (ability to engage)	Empowerment / Information	• **Low Disease Literacy:** Patients possess a deep lack of awareness about chronic respiratory conditions, with many community members being completely unfamiliar with the term COPD and mistakenly perceiving chronic respiratory symptoms merely as acute infectious conditions like a cold, which severely limits their understanding of the disease and their engagement in long-term care. **[Medium]** (Beliefs, Perceptions, and Behaviors Regarding Chronic Lung Disease in Kyrgyzstan: A Mixed-method FRESHAIR Study, 2025)
		Adherence	• **High Overall Non-Adherence:** Quantitative measurements using the Test of Adherence to Inhalers (TAI) reveal that a staggering 80.7% of asthma and COPD patients in Kyrgyzstan exhibit poor adherence to their prescribed respiratory medications, compared to only 7.3% who show good adherence. **[High]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings) • **Deliberate Non-Adherence:** Intentional non-adherent behavior is extremely common, affecting 89.7% of patients, who frequently choose to stop taking their inhalers as soon as their symptoms improve, deliberately take fewer inhalations than prescribed by their doctor, or stop because they feel the inhalers provide little help **[High]** (Medication availability and economic barriers to adherence in asthma and COPD patients in low-resource settings) • Unconscious Non-Adherence: Approximately 31.3% of patients suffer from unconscious non-adherence, meaning they fail to follow treatment plans unintentionally **[Medium]** (Usability of the test of adherence to inhalers toolkit to patients with COPD in Kyrgyzstan)
		Caregiver support	• N/A

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

09

Peru

Methodology
Framework definition
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Detailed challenges (desk review)
Insulin
Inhaled medicines
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Kenya
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The following challenges were identified for inhaled medicines access in Peru (1/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Transparency	• N/A
		Outreach	• N/A
		Information	• **Lack of Service Information:** System-level transparency regarding what specialized services and personnel actually exist is highly deficient. As the source highlights, there is no information available on the use of telemedicine or digital therapies for COPD management in the country, and additionally, no data are reported on the density of respiratory specialists. **[Medium]** (Peru COPD Research and Global Ranking [year not available]) • **Limited Guideline Implementation:** Peru has guidelines, however, the application is deficient, for example, the Peruvian COPD Guide - 2016, which is an adaptation of the Latin American guide. However, its implementation is very limited e.g., only 1% of newly diagnosed patients had received a long-acting bronchodilator (LAMA). **[High]** (Peru COPD Research and Global Ranking)
		Screening	• **Massive Disease Underdiagnosis:** More than 95% of COPD cases in Peru remain undiagnosed due to a lack of routine case-finding and screening. **[High]** (Peru COPD Research and Global Ranking)
	Patients (ability to perceive)	Awareness	• N/A
		Beliefs	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Peru (1/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Patients (ability to perceive)	Trust	• **Lack of Initial Trust:** Patients and caregivers may not immediately trust health workers entering their homes to provide care or education; as noted in a Peruvian pediatric asthma study, "it took some time for trust and rapport to build between the participating families and the nurse managers, especially considering the close engagement required and the regular home visits." **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)
Acceptability	Systems	Professional values	• **Specialist-Dependent Diagnosis Norms:** Diagnosis norms for respiratory conditions have historically been specialist-dependent, with spirometry, though essential for accurate diagnosis, used almost exclusively by pulmonology specialists. **[High]** (Peru COPD Research and Global Ranking) • **Capacity Gaps in Primary Care:** Individuals who cannot be managed by the staff at Level I health centers due to disease complexity are referred through the referral system to higher levels of care. Resources and personnel available for the acute and chronic management of asthma varies by level. Lower level health posts generally do not have personnel able to manage either acute or chronic asthma cases. **[High]** (Implementation of an intervention to improve the adoption of asthma self-management practices in Peru: Asthma Implementation Research (AIRE) randomized trial study protocol, 2020)
		Cultural norms	• N/A
	Patients (ability to seek)	Personal values	• N/A
		Social norms	• N/A

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Peru (2/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Systems	Geographic location	• **Long Travel Times:** Patients in remote districts face significant travel burdens to reach referral hospitals for respiratory care. For example, patients living in the Ancón district must travel approximately 40 kilometers to reach the Cayetano Heredia Hospital, a journey that can take up to 2 hours on public transport. **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)
		Logistics	• N/A
		Supply	• **Shortage of medicines:** Despite asthma medications being provided free of charge to patients enrolled in Peru's national insurance program (Seguro Integral de Salud), access remains inconsistent and heavily dependent on availability at public and private pharmacies as well as community health posts. Short-acting relief medications such as salbutamol (albuterol) are generally accessible across both sectors. However, there is a significant shortage of preventive therapies, including inhaled corticosteroids (ICS), long-acting beta-agonists (LABAs), and combination inhalers. Evidence from multiple studies underscores this gap, with one study reporting particularly low availability of essential preventive medications such as beclomethasone (33.7%) and fluticasone (5.8%), both of which are listed on the WHO Essential Medicines List. **[High]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents: a hybrid type 2 individually randomized controlled trial, 2026; Availability, affordability and access to essential medications for asthma and chronic obstructive pulmonary disease in three low- and middle-income country settings, 2022) • **Limited Diagnostic Services:** Diagnosis is limited, especially in the public sector and outside large cities, and access to spirometry is insufficient, even though it is essential for diagnosis. **[Medium]** (Peru COPD Research and Global Ranking) • **Shortage of Trained Providers:** The supply of capable healthcare staff is insufficient to meet the need, with care disparities largely driven by "under-resourced healthcare systems, a shortage of trained providers, complex referral and medication procurement systems". **[High]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Peru (2/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Patients (ability to reach)	Mobility	• N/A
		Social support	• N/A
Affordability	Systems	Costs	• **High Combination Inhaler Prices:** The cost of medications remains a well-documented and critical barrier to accessing evidence-based asthma care in low-resource communities in Lima. A caregiver of a 10-year-old boy in the intervention arm described the financial strain this places on families: she recounted having to be brave and stay positive for her children, sharing that a combination inhaler she purchased cost 150 soles (~$44 USD), while another medication prescribed by the doctor cost 300 soles (~$88 USD) and still wasn't enough to last a full month. Together, these medications amounted to roughly 500 soles (~$147 USD), a burden she described as overwhelming. **[High]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)
		Funding	• N/A
		Opportunity costs	• **Lost Work and School:** Seeking emergency care for asthma exacerbations imposes an indirect economic burden and opportunity cost on Peruvian families due to work and school days lost. **[High]** (The association between asthma emergency department visits and satellite-derived PM2.5 in Lima, Peru)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Peru (3/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability (Cont'd)	Patients (ability to pay)	Income & assets	• **Hidden Pricing Disparities:** Even if these inhaled medications are available, they are often out of reach financially for families living in poverty. Pricing disparities also exist, with the cost of these medications increasing significantly in rural areas when procured in the private sector. **[High]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents: a hybrid type 2 individually randomized controlled trial, 2026) • **Long-term Therapy Unaffordability:** Essential inhaled medicines are often economically unattainable for the general population, as a 30-day treatment can cost more than the average worker's daily wage. **[High]** (Peru COPD Research and Global Ranking) • **High Monthly Cost Burden:** Quantitative analysis shows that purchasing combination inhalers (like Fluticasone + Salmeterol) for moderate persistent asthma in Peru has a mean total monthly cost of $17.88, which requires 2.12 days' wages for a minimum wage government worker to afford. **[High]** (Availability, affordability and access to essential medications for asthma and chronic obstructive pulmonary disease in three low- and middle-income country settings, 2022)
		Health insurance	• **Public Insurance Gaps:** The national public insurance scheme fails to cover and stock essential long-term therapies, creating a systemic financial barrier where the lack of coverage and regular availability of inhaled corticosteroids in public insurance is a key bottleneck that needs to be addressed. **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Peru (3/4)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness	Systems	Healthcare workers' knowledge	• **Lack of Primary Training:** In Latin American countries, a critical systemic barrier to providing appropriate care is that there is no training of primary health care teams to diagnose and treat asthma. This is true for Peru as well since lower level health posts generally do not have personnel able to manage either acute or chronic asthma cases. **[Medium]** (Understanding and controlling asthma in Latin America: A review of recent research informed by the SCAALA program, 2023; Implementation of an intervention to improve the adoption of asthma self-management practices in Peru: Asthma Implementation Research (AIRE) randomized trial study protocol, 2020)
		Coordination and continuity	• **Poor Disease Monitoring:** Health workers often lack the capacity, tools, or systems to properly track patients longitudinally, as demonstrated in Peruvian peri-urban communities where only 12.8% of children with asthma reported having a doctor that continually monitors their disease. **[High]** (Implementation of an intervention to improve the adoption of asthma self-management practices in Peru: Asthma Implementation Research (AIRE) randomized trial study protocol, 2020)
	Patients (ability to engage)	Empowerment / Information	• **Limited Health Literacy:** Standard written medical instructions and disease tracking tools (such as the "Asma Card") are often ineffective for caregivers in low-resource communities who cannot read or have only completed primary school, this could affect effective management of chronic respiratory diseases. As a practical anecdote from a Peruvian pediatric asthma study highlights, nurses cannot simply hand out written guidelines, they must customize and adapt how health and treatment information is delivered to successfully match each family's specific educational capacity. **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Peru (4/4)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Patients (ability to engage) (Cont'd)	Adherence	• **Limited Guideline Adoption:** While evidence-based guidelines exist for asthma treatment and management, adoption of guideline-based practices is low. While asthma prevalence among children and adolescents in Lima, Peru is in the range of 13%- 19.6%, data suggest that < 5% of children in low-resource communities are currently taking guideline-based therapies. For example 51.5% of patients with persistent asthma reporting that they had never used a preventive controller medication. In addition, limited awareness of environmental triggers, including biofuel exposure, continues to contribute to poor respiratory health and increased COPD risk. **[Medium]** (Implementation of an intervention to improve the adoption of asthma self-management practices in Peru: Asthma Implementation Research (AIRE) randomized trial study protocol, 2020; Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026; Prevalence of chronic obstructive pulmonary disease and variation in risk factors across four geographically diverse resource-limited settings in Peru, 2015) • **Lack of Controller Use:** Even among patients with persistent disease, adherence to long-term preventive inhaler plans is poor, with a research showing that 51.5% of individuals had never been on controller medications despite having persistent asthma. **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)
		Caregiver support	• **Competing Family Priorities:** Families lack the necessary social or structural support to prioritize respiratory care over basic survival, as many families also experienced social and structural challenges, such as poverty, low literacy, and competing priorities that affected their ability to fully engage caregiving. Also families often faced major time constraints, which made it difficult to schedule visits and sustain long-term engagement in the program. **[Medium]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026) • **Caregiver Overwhelm:** Caregivers facing poverty and chronic stress often lack the mental and emotional capacity to adequately support their child's treatment. In such contexts, immediate survival needs frequently take precedence over health-related responsibilities. As one nurse observed, a caregiver was primarily focused on securing enough income to subsist and was so overwhelmed that finding money to survive became her most urgent priority. **[High]** (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial, 2026)

SOURCE: In-line with text; Team analysis

The Union
International Union Against Tuberculosis and Lung Disease

09

Tanzania

Methodology
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Insulin
Inhaled medicines
Global / Cross-country
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The following challenges were identified for inhaled medicines access in Tanzania (1/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Systems	Transparency	• N/A
		Outreach	• N/A
		Information	• N/A
		Screening	• **Absence of CRD Screening:** Health systems for CRDs in Tanzania appear to be weaker at lower-level facilities, despite the significant potential for these facilities to improve early detection and management. In contrast, lower-level health centers have performed well in tuberculosis diagnosis, which has created a growing challenge of handling a large number of chronic cough patients who are found to be TB negative. Ideally, the 96% of patients who tested negative for TB should have been further investigated to rule out CRD and other non-tuberculous respiratory conditions **[High]** (Management of chronic lung diseases in Sudan and Tanzania: how ready are the country health systems, 2021) • **Continued Undiagnosed Visits:** In Tanzania, patients with presumed CRDs who were investigated for TB but tested negative often remained symptomatic and continued returning to health facilities without receiving a definitive CRD diagnosis or a targeted treatment plan. This reflects the absence of an active system to identify undiagnosed CRD needs once TB has been ruled out, leaving many patients trapped in a cycle of persistent illness and repeated care-seeking **[High]** ("Honestly, this problem has affected me a lot": a qualitative exploration of the lived experiences of people with chronic respiratory disease in Sudan and Tanzania, 2023)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Tanzania (1/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Approach-ability	Patients (ability to perceive)	Awareness	• **Lack of Disease Awareness:** In a study of smokers in rural Tanzania, overall awareness of COPD was low, with only 18.8% having heard of the disease. Knowledge gaps were pronounced: 81.2% were unaware of the causes and 82.5% were unsure about curability. Only 16.3% recognized that COPD can be clinically detected **[High]** (Analysis of Knowledge Regarding Chronic Obstructive Pulmonary Disease (COPD) Among Male Smokers in Rwamishenye Ward, Bukoba District, Kagera Region, Tanzania: A Cross-Sectional Study, 2025)
		Beliefs	• **Misbelief of Infectiousness:** Misbelief about infectiousness compounds stigma around CRDs, as community members may interpret chronic cough and related symptoms as signs of highly stigmatized infections such as tuberculosis or HIV. In Tanzania, this has led some people with CRD to withdraw from community gatherings because they feared being seen as contagious and unintentionally transmitting infection to others **[High]** ("Honestly, this problem has affected me a lot"- a qualitative exploration of the lived experiences of people with chronic respiratory disease in Sudan and Tanzania, 2023) • **Misconceptions on Curability:** In a study of male smokers in rural Tanzania, 82.5% of respondents are unsure whether the disease is treatable. More broadly, misconceptions about its causes, risk factors, affected age groups, curability, and clinical detection suggest limited public understanding of the disease and its consequences. These gaps may contribute to delayed diagnosis, continued smoking, and missed opportunities for early intervention **[High]** (Analysis of Knowledge Regarding Chronic Obstructive Pulmonary Disease (COPD) Among Male Smokers in Rwamishenye Ward, Bukoba District, Kagera Region, Tanzania: A Cross Sectional Study, 2025)

SOURCE: In-line with text; Team analysis

TANZANIA

The following challenges were identified for inhaled medicines access in Tanzania (2/5)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Acceptability	Systems	Professional values	• **Time constraints:** Within clinical settings limit physicians' ability to adequately demonstrate proper inhaler techniques. High patient volumes and tightly scheduled consultations leave little room for hands-on instruction, which is critical for effective device use. As a result, even when inhalers are available, doctors are often unable to actively participate in patient education on their correct usage. In most institutions, this responsibility is therefore delegated to nursing staff and pharmacists, who play a supporting role in demonstrating inhaler techniques **[Low]** (Knowledge of inhaler use among medical officers in the management of asthma in children in Dar es salaam, Tanzania, 2020)
		Cultural norms	• N/A
	Patients (ability to seek)	Personal values	• **Preference for Oral Medications:** Tanzanian patients often show a clear preference for oral medications, including aminophylline, salbutamol, and herbal remedies, over inhalers, largely because they perceive tablets to be safer and more comfortable to use. This preference may also reflect limited knowledge about asthma and its management, as well as broader beliefs that oral medicines are more acceptable than inhalational treatments **[High]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022)
		Social norms	• **Family Propagated Misinformation:** A challenge is that knowledge about asthma is often shaped by family and peers, which can perpetuate the false belief that it is highly infectious and may contribute to social avoidance and delayed care-seeking. In Tanzania, studies have found that many students received asthma information from parents, and some believed the condition was contagious, leading them to avoid interacting with classmates who had asthma **[Medium]** (Asthma prevalence, knowledge, and perceptions among secondary school pupils • in rural and urban coastal districts in Tanzania, 2014)
Availability	Systems	Geographic location	• **Restrictive Policy Guidelines:** Restrictive policy guidelines creates barriers to accessing corticosteroid inhalers. In Tanzania, treatment at lower levels of service provision has been limited mainly to bronchodilators and injectable or oral steroids for acute asthma, which may reduce access to inhaled controller therapy **[High]** (What are the barriers to the diagnosis and management of chronic respiratory disease in sub-Saharan Africa? A qualitative study with healthcare workers, national and regional policy stakeholders in five countries, 2022) • **Uneven Distribution of Healthcare Workforce:** In Tanzania, clinical officers, nurses, and pharmacists or pharmacy technicians were the only healthcare cadres consistently available across all facilities, spanning regional hospitals, district hospitals, and health centers. However, the distribution of more specialized personnel was uneven. Of the 21 medical doctors present on the day of the facility visit in a study, 16 (76.2%) were concentrated at the regional hospital, while only one (4.8%) was stationed at a health center. Similarly, nursing staff were disproportionately clustered at higher-level facilities, with the largest share (15 out of 38) based at the district hospital **[Medium]** (Management of chronic lung diseases in Sudan and Tanzania: how ready are the country health systems?, 2021)

SOURCE: In-line with text; Team analysis

TANZANIA

The following challenges were identified for inhaled medicines access in Tanzania (3/5)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Availability	Systems	Logistics	• **Low Health Facility Readiness:** Majority of Tanzanian health facilities have low readiness to provide management for CRDs. Privately owned facilities, higher-level facilities (hospitals and health centers), and performance of routine management meetings were significantly associated with high readiness to provide management for CRDs **[Medium]** (Are Tanzanian health facilities ready to provide management of chronic respiratory diseases? An analysis of national survey for policy implications, 2019)
		Supply	• **Low Availability even for Salbutamol:** Even for short-acting symptom relief, inhaled medicines are not consistently supplied at the facility level, forcing reliance on oral or injectable medications. An analysis of national survey data covering Tanzanian health facilities showed that for basic medicines component, 64.1% and 47.1% of health facilities had injectable epinephrine and hydrocortisone respectively while only 18.6% of the health facilities had inhaled salbutamol available **[High]** (Are Tanzanian health facilities ready to provide management of chronic respiratory diseases? An analysis of national survey for policy implications, 2019) • **Lack of Diagnostic Equipment:** A survey conducted in Tanzania found that only 1.9% of health facilities had the full set of appropriate equipment, including spirometry, required for the management of non-communicable respiratory diseases (NCRDs). Fewer than 10% of health facilities had key items such as oxygen supplies, peak flow meters, and spacer devices **[Medium]** (Availability of diagnostic services and essential medicines for non-communicable respiratory diseases in African countries; Are Tanzanian health facilities ready to provide management of chronic respiratory diseases? An analysis of national survey for policy implications, 2019)
	Patients (ability to reach)	Mobility	• **High Transportation Cost:** Transport costs were a major barrier when health facilities were far from the community, and for some people the burden was significant enough that they preferred the specialist to come closer to them rather than travel themselves. This suggests that reducing distance-related costs could meaningfully improve access to care **[High]** ("Honestly, this problem has affected me a lot": a qualitative exploration of the lived experiences of people with chronic respiratory disease in Sudan and Tanzania, 2023)
		Social support	• N/A

SOURCE: In-line with text; Team analysis

TANZANIA

The following challenges were identified for inhaled medicines access in Tanzania (4/5)

FRAMEWORK			
LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Affordability	Systems	Costs	• N/A
		Funding	• **Insufficient NCD Budgets and Marginalized CRDs:** Traditionally, the Tanzanian health system is designed to provide Reproductive Health services and manage communicable diseases. Despite the increase in NCD cases that create a double burden situation within the country, the budget and resources allocation is still insufficient for management of NCD such as CRDs. Within the broader NCD agenda, chronic lung conditions are often deprioritized because attention and resources tend to focus on more visible or politically salient conditions such as cancer, diabetes, and cardiovascular diseases. **[High]** (Are Tanzanian health facilities ready to provide management of chronic respiratory diseases? An analysis of national survey for policy implications, 2019; Management of chronic lung diseases in Sudan and Tanzania: how ready are the country health systems?, 2021)
		Opportunity costs	• **Clinic Attendance results in lost wages:** Many people living with CRD had to miss work to attend clinic visits, undergo hospitalization, recover after treatment, or return for follow-up appointments. As a result, both they and their families faced direct and indirect economic burdens from lost work time and reduced income. Accompanied by breadwinning family members during repeated health facility visits and hospital admissions, patients often impose additional financial strain on households. These caregivers incur transportation expenses and lose productive working hours, collectively contributing to reduced household income and negatively affecting overall family livelihoods **[Medium]** ("Honestly, this problem has affected me a lot": a qualitative exploration of the lived experiences of people with chronic respiratory disease in Sudan and Tanzania, 2023)
	Patients (ability to pay)	Income & assets	• **Income-Driven Inhaler Switching:** Income levels dictate whether a patient can consistently afford their prescribed inhaler, forcing them to switch devices based on what they can afford at the time. A study at Muhimbili National Hospital in Dar es Salaam observed that some patients were using powder inhalers interchangeably with pMDI depending on availability and income level **[Medium]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022)
		Health insurance	• **Education-Linked Insurance Disparities:** A study found that patients with lower educational attainment were less likely to have health insurance. This suggests a clear association between higher education levels and improved access to health insurance **[Medium]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2020) • **Insurance Non-Acceptance:** A national survey of 723 Tanzanian health facilities found that 58.4% (422 facilities) do not accept health insurance, restricting where insured patients can actually use their coverage to access care for CRDs **[High]** (Availability and affordability of medicines and diagnostic tests recommended for management of asthma and chronic obstructive pulmonary disease in sub-Saharan Africa- a systematic review, 2019, **NOTE: The source is dated; the country is moving towards UHC, this will be needs validation in interviews**)

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Tanzania (5/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Systems (Cont'd)	Healthcare workers' knowledge (Cont'd)	• **Inadequate Knowledge:** Overall, 74.9% of the medical officers (non-specialists), had inadequate knowledge of proper inhaler technique, despite the fact that a vast majority (82.3%) preferred the inhaled route for administering asthma medication to children **[High]** (Knowledge of inhaler use among medical officers in the management of asthma in children in Dar es salaam, Tanzania, 2020) • **Low Clinician Awareness of Guideline:** There was limited awareness of treatment guideline updates with many clinicians still prescribing available oral salbutamol instead of inhalers, despite lack of evidence for efficacy. Likewise, in Tanzania, although the CRD guidelines were available on the MoH website and copies were seen at the sites, participants seemed unaware of their content **[High]** (What are the barriers to the diagnosis and management of chronic respiratory disease in sub-Saharan Africa? A qualitative study with healthcare workers, national and regional policy stakeholders in five countries, 2022) • **Training Deficits:** Health facilities in Tanzania lack staff formally trained in managing CRD. A survey highlighted that less than 10% of the facilities had at least one staff who received training for management of CRDs **[High]** (Are Tanzanian health facilities ready to provide management of chronic respiratory diseases? An analysis of national survey for policy implications, 2019)
		Coordination and continuity	• N/A
	Patients (ability to engage)	Empowerment / Information	• N/A



Allergy Foundation of South Africa

SOURCE: In-line with text; Team analysis

The following challenges were identified for inhaled medicines access in Tanzania (5/5)

FRAMEWORK

LEVEL 1	LEVEL 2	LEVEL 3	DESCRIPTION
Appropriate-ness (Cont'd)	Patients (ability to engage)	Adherence	• **High Overall Non-Adherence:** In a study at Muhimbili National Hospital in Dar es Salaam, adherence to prescribed inhalers is low. Research involving 385 asthma patients found that only 17.9% demonstrated good adherence, while 84 (21.8%) had intermediate adherence and 232(60.3%) were non- adherent to inhalers **[High]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022) • **Incorrect Inhaler Technique:** The inability to properly administer inhaled medication is a massive driver of treatment failure. In a study, the majority (71.6%) demonstrated incorrect inhaler technique among the non-adherent group, and overall, patients who had incorrect inhaler technique had 12 times increased odds of non-adherence compared to those with good technique **[Medium]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022) • **Fear of Side Effects:** Patient fears and misconceptions regarding the medication disrupt adherence to respiratory treatment plans. Data from Dar es Salaam shows that respondents who had fear of side effects for inhalational medications had 8.2 times increased odds of non-adherence compared to those who had no fear **[Medium]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022) • **Busy Daily Schedules:** Competing life and work priorities, particularly for the self-employed, prevent consistent engagement with prescribed inhaled therapies. The study noted that participants who reported to be too busy with their daily activities were non adherent to inhaler medication, specifically finding that the odds of inhaler non-adherence were about 6 times more among respondents who were too busy than those who weren't **[Medium]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022) • **Preference for Alternative Medications:** The concurrent use of alternative or oral treatments undermines adherence to prescribed maintenance inhalers. Participants in a study who had alternative medications for asthma apart from inhalational medication had 2.1 times increased odds of non-adherence, which researchers largely attribute to a prevailing belief on oral medication that they are safer than inhalational medications **[High]** (Inhaler Non-Adherence, Associated Factors and Asthma Control among Asthma Patients in a Tertiary Level Hospital in Tanzania, 2022)
		Caregiver support	• N/A

SOURCE: In-line with text; Team analysis

The Union

International Union Against Tuberculosis and Lung Disease

09

APPENDIX / DETAILED INITIATIVES

Insulin

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Detailed initiatives
Insulin
Inhaled medicines

Kenya: Insulin initiatives (1/4)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	**Base of the Pyramid (BoP) project**	The Base of the Pyramid (BoP) project is a public–private partnership initiated by Novo Nordisk that aims to facilitate access to diabetes care for people at the base of the economic pyramid in low- and middle-income countries (LMICs). Novo Nordisk signed Memorandums of Understanding (MoUs) with every link in the local drug distribution chain (including local distributors and faith-based organizations) to strictly limit their price mark-ups. In Kenya, the BoP, through a partnership model, aims to strengthen five pillars of diabetes care: increased awareness of diabetes; early diagnosis of diabetes; access to quality care by trained professionals; stable and affordable insulin supply; and improved self-management through patient education. In Meru, the BoP facilitated some free screening activities at faith-based organizations (FBO) facilities between 2013 and 2015, involving free finger stick blood glucose testing with a glucose meter along with education. This campaign was perceived by staff as being successful in attracting patients to health care facilities and improving initial contact with the healthcare system. To build local capacity, the project established “centers of excellence” for diabetes care at specific local public hospitals. For rural clinics, the project brought one or two staff members per facility to centralized venues for annual training events. They also provided highly valued printed medical resources and attempted to set up a mentoring component to link rural staff to greater expertise. At the facility level, the project established Diabetic Support Groups that met on designated clinic days. These groups were designed as a space for patients to share their experiences and strategies for coping with the disease. The project also developed and distributed patient education materials translated into local languages (Innovating to increase access to diabetes care in Kenya: an evaluation of Novo Nordisk’s base of the pyramid project)	The BoP was implemented in 28 of 47 counties in Kenya. Meru, a county where BoP was implemented, had 35 of 62 facilities (56%) participating in the BoP. Of the five pillars of the BoP, most notable progress was made in achieving the fourth (stable and affordable insulin supply). A price ceiling of 500KSh (US$5) per vial of insulin was established in the intervention county, with greater fluctuation and stock-outs in the non-intervention county. Despite reduced insulin costs, many patients with diabetes could not afford the additive expenses of monitoring, medicines, and travel. Less progress was made over the other pillars, which also faced challenges to sustainability and scalability.	Access program along with health systems strengthening

SOURCE: In-line with text; Team analysis

Kenya: Insulin initiatives (1/4)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	**Changing Diabetes in Children (CDiC) program**	The Changing Diabetes in Children (CDiC) project is a public-private partnership implemented by Novo Nordisk since 2012, to improve access to diabetes care for children with Type 1 Diabetes and has been implemented using a “hub-and-spoke” model, with 12 hubs and 14 spokes distributed across the country. The CDiC scheme provides a stable supply of free insulin to children in implementing facilities in Kenya and Bangladesh, and offers a comprehensive package of pediatric diabetes care. However, the program has some important limitations, including a lack of support for young people graduating from the program into adult care. the CDiC program appeared to provide a dependable supply of free insulin to children in implementing facilities, However, the program has some important limitations, including a lack of support for young people graduating from the program into adult care (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Scale (Country-level roll-out)



SOURCE: In-line with text; Team analysis

Kenya: Insulin initiatives (2/4)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	**Academic Model Providing Access to Healthcare (AMPATH)**	A comprehensive diabetes care program, with initial organized diabetes care efforts starting in 2001, developed to provide basic modalities of diabetes care for more than 5,000 patients. The program includes reliable stocks of subsidized/donated insulin, A1C and point-of-care glucose testing, patient education, and a contextualized electronic medical record (EMR) system. It established a cell phone-based home glucose monitoring program across 2 rural sites, providing care for more than 2,100 patients (Dynamics, Impact, and Feasibility of Self-Monitoring of Blood Glucose in the Rural, Resource-Constrained Setting of Western Kenya; The evolution of diabetes care in the rural, resource-constrained setting of western Kenya)	An evaluation of patients enrolled in this intensive phone-based program between January 2008 and March 2010 (a cohort of 137 patients) demonstrated a median A1C reduction of 4 points (from 13.3% to 9.3%) after 6 months. By the end of 2014, the phone-based monitoring component had expanded to include over 750 patients through a mix of corporate support and monthly patient user fees	Scale (Country-level roll-out)
	Ngao Ya Afya (Shield for Health) program	To tackle challenges in the provision of care for NCDs, Sanofi launched a pilot project in Kenya in 2018 called 'Ngao Ya Afya'. The initiative, which was implemented in partnership with international and local stakeholders, encompassed digital and non-digital interventions to improve access to care for patients with diabetes and hypertension. It included giving access to discounted consultations, medical tests and discounted Sanofi medicines such as glargine (Lantus), as well as some non-Sanofi medicines. The initiative also provided tools for monitoring glucose, alongside a digital platform patients could use to aid self-management. (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)	In 2019, 675 patients had access to discounted prices through the digital health wallet for diabetes and/or hypertension treatments	Implementation Research

SOURCE: In-line with text; Team analysis

Kenya: Insulin initiatives (2/4)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	**iCARE initiative**	The iCARE initiative was launched in 2021 as a business-integrated model aimed to improve access to diabetes treatment in 49 countries in sub-Saharan Africa through four areas of work (Capacity, Affordability, Reach and Empowerment). The initiative aims to substantially increase the number of people with diabetes accessing insulin in sub-Saharan Africa (excluding South Africa) by 2025. iCARE has been launched in seven pilot countries so far including Kenya. This initiative targets challenges such as affordability barriers impeding access to care for vulnerable patients, hurdles in procurement and supply chains (including last-mile distribution), mark-ups, inadequate forecasting, healthcare practitioners' capacity, knowledge gaps in diabetes management, and patient education. In these pilot countries, it has engaged with local governments and local partners to carry out localized strategies and track the impact of the approach. The initiative also aims to achieve both affordability and financial sustainability, as increased sales volumes will enable lower costs and thereby lower prices(What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Scale (Country-level roll-out)

SOURCE: In-line with text; Team analysis

Kenya: Insulin initiatives (3/4)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	**Diabetes CarePak**	To tackle the fragmentation of product provision, Novo Nordisk are taking part in the Diabetes CarePak initiative, which is carried out by PATH. This co-packaging solution aims to increase access to safe administration of insulin and self-care at the primary care level by bundling necessary commodities such as glucometers, test strips, needles and syringes, in line with the needs of people with diabetes. CarePak has been rolled out in Kenya with the support of Novo Nordisk (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Pooled procurement (Pilot)
	Sanofi State Partnership and Patient Support Programme	Sanofi tailors its pricing strategies to both the public sector and private sector markets. The company offers a price for its insulin glargine (Lantus) in the public sector that is low enough to ensure it can be listed for complete reimbursement. For patients paying out of pocket, there is a state partnership and patient support program which provides a free cartridge of insulin glargine (Lantus) for every two cartridges purchased by new patients. This product is also available in Kenya via a private health insurance, which Sanofi made possible by signing a commercial agreement (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Scale (Country-level roll-out)
	Life for a Child (LFAC) program	An insulin donation program utilizing Eli Lilly insulin to provide free care for children and young adults at the Kenyatta National Hospital in Nairobi (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Implementation Research
	Coalition for Access to NCD Medicines & Products Forecasting Tool program	As part of the multisectoral Coalition for Access to NCD Medicines & Products, which is working to implement a forecasting tool to be used for estimating annual quantities and costs of products for diabetes care. This initiative, carried out in collaboration with PATH and several local ministries of health, is providing technical guidance to communicate with key country stakeholders and make better use of forecasting results to inform financing and procurement processes. The program covers Kenya and Uganda, and an evaluation of the initiative took place during 2022 (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Capacity building

SOURCE: In-line with text; Team analysis

Kenya: Insulin initiatives (4/4)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	**ACCEDE project**	In 2023, FIND started the ACCEDE project (Access to Continuous Glucose Monitoring System for Equity in Diabetes management) which seeks to make Continuous Glucose Monitoring more accessible and affordable in Kenya and South Africa, as well as generating valuable resource and data for the global community (Moving Forward on Access to Glucose Self-Monitoring Technologies for the Management of Diabetes)	To date, the project had the following outputs: a. Two free CGM online trainings, co-developed with the International Diabetes Federation (IDF): one for healthcare professionals and one for people living with diabetes, hosted under the IDF School for Diabetes. b. An operational research study to address the evidence gap on the impact of CGM use on clinical outcomes in LMICs, assessing different use-cases. The research protocol of the study has been published and results are expected in early 2026. c. A CGM performance evaluation fact sheet, for users and healthcare providers to aid in the understanding of CGM analytical performance data and judge the quality of the evidence.	Implementation Research
	Minimum Care Package / THANDYS study	A study finds that while TB and HIV care in Kenya is partly subsidized, managing co-morbid diabetes adds modest but important costs that worsen patient outcomes if unaddressed. It proposes a minimum subsidized care package that integrates dysglycemia management into TB/HIV services, including glucose monitoring, cardiovascular and eye screening, foot care, and risk counselling. This package is relatively low-cost and far cheaper than treating complications like drug-resistant TB, making it a cost-effective step toward universal health coverage (Health system perspective costing of TB, HIV and dysglycaemia (prediabetes and diabetes) in Kenya and a minimum care package policy proposal: the THANDYS study)		Implementation Research

SOURCE: In-line with text; Team analysis

Kyrgyzstan: Insulin initiatives (1/2)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kyrgyzstan	**Establishment of KyrgyzPharmacia for Centralized Procurement of generics**	Between 2019 and 2022, the Kyrgyzstan government procured human and analogue insulin through tenders, with Novo Nordisk as the only bidder for human insulin because biosimilars were excluded. Human insulin prices ranged from US$3.07 to US$4.31 per vial, while analogue insulin products such as prefilled pens and cartridges were much more expensive, ranging from US$39.37 to US$81.93 per pack. In 2023, KyrgyzPharmacia was established under the Ministry of Health to procure quality generics and originator brands at discounted prices. Insulin prices were negotiated and opened to all manufacturers (GOVERNMENT PROCUREMENT OF INSULIN: CASE STUDIES IN 11 LOW- AND MIDDLE-INCOME COUNTRIES)	Lowered the price of human insulin to under US$3 per vial, a 15% drop from 2022. Analogue insulins such as NovoRapid, Levemir, and Lantus also became cheaper than in previous years, but they remained far more expensive than human insulin, even though smaller quantities were purchased	Pooled procurement
	State-Guaranteed Benefit Package (SGBP)	State Guaranteed Benefit Programme (SGBP) guarantees people free care at all health care levels, including insulin, delivery devices and a limited number of self-glucose testing supplies. (The Road to Free Insulin: Kyrgyzstan Case Study)	Insulin is fully provided free of charge to all people in need, but there is a lack of funding for other medications and diabetes supplies needed, including oral hypoglycemic drugs and insulin injection devices (syringes)	Scale (Country-level roll-out)
	“Schools of Diabetes” Patient Education Programs	These schools were established with the assistance of non-governmental organizations to educate patients about healthy lifestyles, nutrition, physical activity, and the consequences of diabetes. (The Road to Free Insulin: Kyrgyzstan Case Study; Diabetes in Kyrgyzstan)	While they are well-developed at the central level in the capital (Bishkek), they do not operate at the primary health care (PHC) level in the regions. As a result, rural patients remain poorly informed and fail to adhere to continuous treatment	Capacity building
	Public-Private Partnership for Glucose Monitoring Devices	Local endocrinologists proposed a public-private partnership model where the government provides glucose monitoring devices and the patient co-pays for a third or half of the device’s price. (Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) – Phase 2: Study Report)	The theoretical outcome is that patients who financially invest in their device and supplies will be more motivated to control their glucose levels accurately	Implementation Research

SOURCE: In-line with text; Team analysis

Kyrgyzstan: Insulin initiatives (2/2)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kyrgyzstan	**National Diabetes Registry**	A national patient registry was implemented across all regions to track the number of individuals with diabetes to support procurement planning. (Diabetes in Kyrgyzstan; Policy Brief Rapid Assessment Protocol for Insulin Access and Health Care for Patients with Diabetes; The Road to Free Insulin- Kyrgyzstan Case Study)	The tool has failed its logistical purpose because the data collected is actively ignored when planning the procurement of insulin and hypoglycemic drugs. The system of data centralization and collection of the Registry remains complicated. Persons responsible for maintaining the Registry are not well trained and the existing procedures do not ensure the quality of data. Due to this reasons the government relies on previous years' purchase data instead, resulting directly in irrational quantification, the expiration of surplus insulin, and simultaneous stock shortages in various health facilities	Scale (Country-level roll-out)
	Approval of Clinical Guidelines and Protocols	In 2009, a clinical guideline "Diagnosis, management and prevention of type 2 diabetes at the primary health care level" as well as evidence-based clinical protocols on management of diabetic nephropathy, neuropathy and retinopathy were approved. (The Road to Free Insulin: Kyrgyzstan Case Study, Diabetes in Kyrgyzstan; Policy Brief Rapid Assessment Protocol for Insulin Access and Health Care for Patients with Diabetes)	Implementation of these guidelines has certain barriers like shortage of medical staff, excessive workloads, absence of monitoring standards, and therefore not all family doctors have been trained in the approved clinical guidelines. Eventually despite increase in training, family doctors are still not prepared to support management of people using insulin	Capacity building
	Free Provision of Metformin	Since 2021, metformin has been provided by the government at a 50% discount for the insured, but public-sector availability was still only 11.8% in 2023. From 2024, under the SGBP, all people with diabetes are entitled to receive 600 tablets of metformin free each year (Diabetes in Kyrgyzstan)		Scale (Country-level roll-out)

SOURCE: In-line with text; Team analysis

Peru: Insulin initiatives (1/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Peru	**Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) – Phase 2**	The main objective of this project is to improve access to insulin in Peru. Among the specific objectives are: 1) raise awareness of the need to improve diabetes care and the access to insulin in the national health system, 2) familiarize stakeholders with the results of previous ACCISS studies in Peru and around the world, 3) develop an insulin acquisition and distribution plan to improve the availability and affordability of insulin in the public sector, 4) create a tool to monitor the prices and availability of insulin in different regions of the country, 5) develop a manual for the use of insulin and promote its use by health personnel, and 6) improve knowledge of civil society regarding better access to treatment and care for people with type 1 diabetes. (Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) – Phase 2; Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) – Phase 2: Study Report) Note: Phase 1 is not included because it is an assessment	Developed an insulin use manual, produced policy briefs on human insulin and type 1 diabetes	Implementation Research
	Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) – Phase 3	The project implemented a hybrid training course and an insulin use manual in the public health system of the Tumbes region, through a virtual training course for health personnel on insulin use and monitoring that culminated in a face-to-face workshop on insulin application. It monitored the availability and prices of insulin, administration devices and glucose self-monitoring devices in health facilities and homes in Peru, and used co-creation to develop a core outcome set that incorporated the perspectives of patients, caregivers, health personnel and stakeholders, considering type 1 diabetes mellitus as a model (Addressing the Challenge and Constraints of Insulin Sources and Supply – ACCISS Phase 3; Implementation of multiparameter point-of-care devices for non-communicable diseases at primary healthcare level. Phase 3: Implementation)	Successfully used a co-creation approach to develop a core outcome set utilizing perspectives from patients, caregivers, and decision-makers, and published results on stakeholder engagement.	Implementation Research

SOURCE: In-line with text; Team analysis

Peru: Insulin initiatives (1/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Peru	**Addressing the Challenge and Constraints of Insulin Sources and Supply (ACCISS) – Phase 4**	Phase 4 of the ACCISS project in Peru focuses on consolidating and expanding previous achievements to improve insulin access nationwide. It strengthens awareness and diabetes care through enhanced telemedicine in two regions and continued training of primary healthcare workers in insulin use, diabetes management, and nutrition, including creating diabetes care leaders at the primary care level. It develops a plan for insulin acquisition and distribution in the public sector, assessing needs, procurement processes, and bottlenecks, and engages patient organizations to understand and enhance their impact on advocacy and patient-centered care. The phase also continues monitoring the availability and prices of insulin and self-monitoring devices for a multi-country study, and uses co-design with stakeholders to develop, validate, and pilot an intervention to improve the quality of life of people with Type 1 diabetes. (Addressing the Challenge and Constraints of Insulin Sources and Supply – ACCISS Phase 4)		Implementation Research

SOURCE: In-line with text; Team analysis

Peru: Insulin initiatives (2/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Peru	**WebDia-Mundi (Adaptation of an mHealth Solution)**	WebDia, an innovative mobile health (mHealth) app developed in Switzerland. Originally in French and tailored to the Swiss diet, the app required adaptation to suit the Peruvian context. One of the primary modifications was the translation of WebDia into Spanish. Based on this input, an improved version, now called WebDia-Mundi, was developed. The app assists individuals with diabetes who use insulin to count carbohydrates and adjust insulin treatment. The study included comprehensive training in CC [carbohydrate counting], instructions on using the app to perform CC as part of self-monitoring, and how to adjust insulin doses in a personalized way. Workshops were conducted across 3 regions of Peru (Arequipa, Lima, and Trujillo) targeting HCWs, children, and adolescents living with T1DM, and their caregivers (Adaptation of an mHealth Solution for the Nutritional Management of Diabetes in a Low- and Middle-Income Country- Pre-Post Mixed Methods Pilot Study)	Results show no significant changes in the mean glycosylated hemoglobin level of children and adolescents living with T1DM after 3 months. Researchers noted that introducing an alternative management style might necessitate an adaptation period for patients to assimilate the concept of CC, potentially extending beyond 3 months	Implementation Research

SOURCE: In-line with text; Team analysis

Peru: Insulin initiatives (2/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Peru	**Effect of Individual and Mixed Economic Incentives**	This exploratory project assessed whether economic incentives could promote weight reduction and improve glycemic control in patients with type 2 diabetes mellitus, and generated evidence to design a future clinical trial comparing individual incentives versus mixed incentives (shared by patients and companions). It also explored patients' perceptions of weight-loss goals, the profile and role of companions, and longer-term outcomes such as morbidity and mortality in patients with diabetes to inform sample size assumptions for a future trial. The study had three phases: a formative study using questionnaires and in-depth interviews with patients and family members to define appropriate incentive amounts, delivery mechanisms, and understand companion dynamics; a pilot randomized study with 54 patients (18 per arm) to compare individual versus mixed incentives on weight and HbA1c and to assess implementation processes; and a qualitative evaluation phase with in-depth interviews of pilot participants and their families to capture their experiences with the incentive strategy. (Pilot Study on the Effect of Individual and Mixed Economic Incentives on Diabetes Control)	Out of 783 patients screened, a total of 54 participants, 18 per study arm, were enrolled and 44 (82%) completed the 3-month follow-up. Mean baseline HbA1c values were 8.5%, 7.9% and 8.2% in Arm 1, Arm 2, and Arm 3, respectively. At 3 months, participants in all three study arms showed reductions in HbA1c ranging from -0.9% in Arm 2 to -1.4% in Arm 1. Weight and Body Mass Index also showed reductions.	Implementation Research
	Implementation of multiparameter point-of-care (POCT) devices	This is a quasi-experimental cluster trial with concurrent control. The study compares the usual standard of care versus the implementation of Point-of-Care Testing (POCT) in the detection and follow-up of non-communicable diseases in patients who received care at the first level. The place of study is Tumbes, Peru (Implementation of multiparameter point-of-care devices for non-communicable diseases at primary healthcare level. Phase 3: Implementation)	The evaluation of the intervention using POCT alone increased the detection of new diabetes cases compared to conventional tests (CT). When the combination of POCT plus CT was assessed, intervention sites showed an even greater increase in the detection of diabetes diagnoses and high cholesterol	Implementation Research

SOURCE: In-line with text; Team analysis

Peru: Insulin initiatives (3/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Peru	**NCD policy lab: Improving access to medicines and technologies for Non-Communicable Diseases (NCDs) using diabetes as a key indicator**	A 4-year project funded by the Swiss Agency for Development and Cooperation to improve access to essential medicines and technologies, using diabetes as a tracer condition. Involves research, capacity building, and social commitment. (Informative Webinar about WHO Prequalification Programme & Insulins; NCD policy lab: Improving access to medicines and technologies for Non-Communicable Diseases (NCDs) using diabetes as a key indicator – Cronicas)		Capacity building
	Approval of Guide for T1D	The practical guide for type 1 diabetes diagnostic and treatment in children, adolescent and adults with diabetes was approved in May 2024 (Diabetes in Peru)		Capacity building
	Decentralized Institutional Purchase Orders	The MoH in Peru delegates centralized drug procurement for public health structures to an entity within the MoH called CENARES. In case of stock-outs or need for specific medicines which are not listed on the current nEML, after an approval of a technical committee sitting at the MoH, public health structures can procure medicines directly on the Peruvian market in a decentralized mode through institutional purchase orders (GUIDELINES FOR PROCUREMENT OF INSULINS AND ASSOCIATED SUPPLIES)		Pooled Procurement

SOURCE: In-line with text; Team analysis

Tanzania: Insulin initiatives (1/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Tanzania	**Life For A Child (LFAC)**	A donation program supported by Eli Lilly and the IDF providing free human insulin, syringes, monitoring equipment, and education to children and youth up to 26 years of age. Reached 1,753 registered children by 2019. In combination with CDiC, helped expand dedicated clinics to 187 district and hospitals (COMPANY AND COMPANY-SUPPORTED PROGRAMMES WITH A COMPONENT OF DONATED INSULIN IN LOW- AND MIDDLEINCOME COUNTRIES; The Development of a National Diabetes Programme in Tanzania)	decreased severe ketoacidosis cases from 10% in 2011 to 0.6% in 2014.	Implementation Research
	Changing Diabetes in Children (CDiC) program	In 2010, the CDiC program was launched in Tanzania, as a collaborative effort between Novo Nordisk, the World Diabetes Foundation, Roche Diabetes Care, and the Tanzania Diabetes Association. The extension included the continuous supply of insulin and blood glucose monitoring equipment. Other components included quarterly Hb1Ac monitoring, screening for complications, diabetes camps and patient education materials in English and Swahili. Reached over 1,800 children since its inception. From 2015 onwards, over US$550,000 has been donated towards project activities and management. (The Development of a National Diabetes Programme in Tanzania)	Donated 121,000 vials of insulin, 32,900 packs of test strips, and 470 glucose meters, facilitating the expansion of clinics and patient survival.	Implementation Research

SOURCE: In-line with text; Team analysis

Tanzania: Insulin initiatives (2/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Tanzania	**Doctors with Africa CUAMM NCDs clinic**	In Tosamaganga Hospital, in the rural area of Iringa district in Tanzania, the Non-Governative-Organization Doctors with Africa CUAMM, has launched a project dedicated to NCDs. Special attention is given to diabetic patients on insulin therapy, to whom a special day called "Insulin Day" is dedicated. It is held every 50 days: patients are educated about diabetes, insulin management, and receive the necessary therapy and tools for glycemic monitoring free of charge. The insulin administered is Premixed regular insulin/NPH 30/70 insulin, combines 30% short-acting Regular insulin and 70% intermediate-acting NPH insulin in one dose. (Management of insulin-dependent diabetes in low-resource countries- results from the chronic noncommunicable disease project in Iringa rural district of Tanzania)	Out of 33 people surveyed, 28 reported that they had gone through at least one hospitalization before starting treatment in Tosamaganga; of these, 82.1% did not undergo further hospitalizations thereafter. All but one of the patients resumed or perform better in their activities subsequent to taking assignment from the NCDs clinic, almost all patients resumed and improved their work ability following the initiation of insulin therapy	Capacity building
	TDYA WhatsApp Group	Tanzania Diabetes Youth Alliance (TDYA) runs a very active WhatsApp group of young people with type 1 diabetes, which had 169 members in 2019, in a context where most young people in Tanzania have a mobile phone. Some doctors and nurses also participate in the group, responding to more technical medical questions when they arise. Many questions are raised in this group regarding the transition out of the donation program, such as how to enroll for the NHIF, where to get insulin, how to deal with fluctuations in glucose control, and questions regarding reproductive health and pregnancy. (The Development of a National Diabetes Programme in Tanzania)		Implementation Research

SOURCE: In-line with text; Team analysis

Tanzania: Insulin initiatives (2/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Tanzania	**Electronic Smart Card**	Tanzania Diabetes Youth Alliance (TDYA) has been working with IT Hub at Tanzania Commission for Science and Technology to develop an electronic smart card for each child with type 1 diabetes which can be linked to Health Management Information System of the MoH and President's Office - Regional Administration and Local Government (Tanzania). The smart card will carry all relevant details of the child and will register each clinic visit and supplies received so as to track the supply chain but also clinic attendance (The Development of a National Diabetes Programme in Tanzania)		Capacity building
	Updated National Clinical Guidelines for Diabetes	In 2021 and 2022, the national clinical guidelines for diabetes, which had been developed in 2018, were updated. They are closely linked to the East African diabetes guidelines and introduced practical disease management guidelines, e.g., on using and discarding syringes (The Development of a National Diabetes Programme in Tanzania)		Capacity building
	Mission 10 cents	Biocon is looking to take part in a pan-African project entitled 'Mission 10 cents' starting in Tanzania whereby certain insulins will be sold at less than 10 US cents per day (Utilization and expenditure on long-acting insulin analogues among selected middle-income countries with high patient co-payment levels- findings and implications for the future)		Capacity building

SOURCE: In-line with text; Team analysis

Tanzania: Insulin initiatives (3/3)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Tanzania	**Diabetes CarePak**	Diabetes CarePak is co-packaging solution aims to increase access to safe administration of insulin and self-care at the primary care level by bundling necessary commodities such as glucometers, test strips, needles and syringes, in line with the needs of people with diabetes. Diabetes CarePak project was piloted Kenya. With funding from the Helmsley Charitable Trust, this project will expand to Tanzania, Mozambique and Mali (Pooled Procurement of Insulin and Associated Supplies; What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Pooled procurement (Pilot)
	Impact of Self-Monitoring Blood Glucose on Glycemic Control Among Insulin: A Randomized Controlled Trial	A hospital-based interventional study, a 6-month randomized clinical trial conducted at the outpatient diabetes clinic at Kilimanjaro Christian Medical Centre from December 2022 to May 2023. A total of 85 participants were recruited into the study and categorized into the intervention and control groups. The intervention group received glucose meters, test strips, logbooks, and extensive SMBG training	Structured SMBG improved glycemic control with a HbA1c reduction of –1.01 (95% confidence interval (CI) –1.39, –0.63) in the intervention group within 3 months from baseline compared to controls of 0.18 (95% CI –0.07, 0.44) ($p < 0\ 001$)	Implementation Research
	iCARE initiative	The iCARE initiative was launched in 2021 as a business-integrated model aimed to improve access to diabetes treatment in 49 countries in sub-Saharan Africa through four areas of work (Capacity, Affordability, Reach and Empowerment). The initiative aims to substantially increase the number of people with diabetes accessing insulin in sub-Saharan Africa (excluding South Africa) by 2025. iCARE has been launched in seven pilot countries including Tanzania. This initiative targets challenges such as affordability barriers impeding access to care for vulnerable patients, hurdles in procurement and supply chains (including last-mile distribution), mark-ups, inadequate forecasting, healthcare practitioners' capacity, knowledge gaps in diabetes management, and patient education. In these pilot countries, it has engaged with local governments and local partners to carry out localized strategies and track the impact of the approach. The initiative also aims to achieve both affordability and financial sustainability, as increased sales volumes will enable lower costs and thereby lower prices (What are pharma companies doing to expand access to insulin – and how can efforts be scaled up?)		Scale (Country-level roll-out)

SOURCE: In-line with text; Team analysis

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09

APPENDIX / DETAILED INITIATIVES

Inhaled medicines

Methodology
Framework definition
Interviews summaries
Detailed challenges (desk review)
Detailed initiatives
- Insulin
- **Inhaled medicines**

Kenya: Inhaled medicines initiatives (1/2)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya (among others)	Novartis Access Project	Novartis Access (2016-2018), a social business program that provides a basket of 15 noncommunicable disease (NCD) medicines to public and private nonprofit health organizations. Novartis supplied inhalers free at the point of use as part of a randomized controlled trial aimed at improving access to essential respiratory medicines in Kenya (Chronic respiratory diseases in Meru County, Kenya: how do public health systems respond and what are the opportunities for health system strengthening?; Access to medicines for asthma, diabetes and hypertension in eight counties of Kenya)	Novartis provided free inhalers at the point of use in a randomized controlled trial in Kenya, but uptake did not increase in the intervention arm, showing that availability and cost were not the only barriers.	Implementation Research
Kenya	Module 13 for Community Health Volunteers	An initiative (2018-19) to enhance asthma treatment capacity by developing "Module 13," a training module for community health volunteers in Kenya by MoH to help them identify and manage asthma at the community level (What are the barriers to the diagnosis and management of chronic respiratory disease in sub-Saharan Africa? A qualitative study with healthcare workers, national and regional policy stakeholders in five countries)	N/A	Capacity building
Kenya (among others)	Kenya Integrated Program on Asthma, COPD and TB (iPACT)	An integrated lung health program led by Kenya's Ministry of Health with support from CHAI and funding from the Gates Foundation and GSK. Rather than screening for TB alone, iPACT trains health workers to screen, diagnose, and manage TB, asthma, and COPD through a single care pathway, using digital chest X-rays with AI-assisted reading to support diagnosis. Over one million people have been screened, identifying 14,823 TB cases alongside 4,476 cases of asthma, 1,278 of COPD, and 617 of lung fibrosis that would have gone undetected under a TB-only model (TB has a hiding place. Integrated TB screening is finding it)	N/A	Implementation Research

SOURCE: In-line with text; Team analysis

Kenya: Inhaled medicines initiatives (1/2)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya (among others)	Improving Equity in Respiratory Disease Outcomes in Africa using Data-Driven Tools	A 4-year global health research program (2024–2028) led by the University of Edinburgh, aiming to reduce deaths, disabilities, and broader health and societal impacts from respiratory diseases including COPD, asthma, tuberculosis, pneumonia, influenza and lung cancer across five African countries with high RD burden. The program brings together an interdisciplinary group of academics, policymakers, NGO representatives, patients, and civil society (Improving Equity in Respiratory Disease Outcomes in Africa using Data-Driven Tools: EQUI-RESP-AFRICA)	N/A	Implementation Research
Kenya (among others)	Africa PUMUA Initiative	The Africa PUMUA Initiative (2022–?) is an AstraZeneca-led program to transform asthma care across Africa. Launched in six countries, including Kenya, it targets pediatric and adult care across public and private sectors through partnerships with governments, healthcare professionals, and societies. It focuses on strengthening health systems, building provider capacity, raising awareness, and improving equitable access to AstraZeneca's respiratory medicines (AstraZeneca launches Africa PUMUA Initiative to redefine asthma care in Africa)	Did not succeed as broader health systems strengthening did not take place (Team knowledge from interviews)	Access program along with health systems strengthening

SOURCE: In-line with text; Team analysis

Kenya: Inhaled medicines initiatives (2/2)

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kenya	TB REACH Vumbua Project	The Vumbua Project, led by Centre for Health Solutions-Kenya with the National TB Program and Stop TB Partnership in Thika and Limuru, built an integrated model linking TB, respiratory diseases like asthma and COPD, mental health, and nutrition into one system rather than separate silos. It reached 165,237 people, screened 135,500, and drove a 31% rise in TB notifications (1,248 to 1,633 between 2024 and 2025), while also identifying hundreds of asthma and COPD cases, 1,964 mental health patients, and 2,878 nutrition patients, using tools like AI-enabled X-rays, POCUS, and spirometry alongside trained community health promoters and roving specialists. Kiambu County has committed to adopting the model, the national Lung Health policy has been approved, and partners including Stop TB Partnership, CIPLA, and AstraZeneca remain involved, with stakeholders framing the results as evidence for scaling integrated care nationally rather than treating it as a one-off pilot. (One Patient, One Journey, One System: The TB Reach Vumbua Legacy and the Future of Integrated Health in Kenya)		Implementation Research



SOURCE: In-line with text; Team analysis

Kyrgyzstan: Inhaled medicines initiatives

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Kyrgyzstan	**Test of Adherence to Inhalers (TAI) Toolkit Study**	This observational study (2023) was conducted in both primary and tertiary care settings at the National Centre of Cardiology and Internal Medicine in Bishkek, Kyrgyzstan. The Test of Adherence to Inhalers (TAI) Toolkit was translated and adapted to fit the local context and was implemented in routine practice by nine physicians and three residents with a cohort of 100 COPD patients. The toolkit was specifically designed to address gaps in treatment adherence by providing individualized strategies to enhance adherence to inhaler therapy (Usability of the test of adherence to inhalers toolkit to patients with COPD in Kyrgyzstan)	The TAI Toolkit showed strong feasibility and usability in Kyrgyzstan. Overall, 91.7% of physicians were satisfied, while both patients and physicians expressed high levels of satisfaction, with mean ratings of 8.8 and 8.6, respectively.	Implementation Research
	FRESH AIR Project	This study was part of the FRESH AIR implementation research project (2015–2018) under the EU Horizon 2020 program, aimed at improving prevention, diagnosis, and treatment of chronic lung diseases in low-resource settings. Key interventions included cleaner cookstoves, smoking cessation (Very Brief Advice) via trained family physicians, digital spirometry training for providers, and pulmonary rehabilitation for COPD, asthma, and post-tuberculosis lung disease (Clinical Characteristics, Treatment Patterns and Economic Burden of COPD in Kyrgyzstan: A FRESH AIR Study)	Following the implementation of cleaner cookstoves, there was a reduction in respiratory symptoms among both adults and children, alongside a decrease in PM2.5 levels. (NOTE: Training and capacity building outcome is not available) The study also resulted in the availability of data about medicines	Implementation Research

SOURCE: In-line with text; Team analysis

Peru: Inhaled medicines initiatives

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Peru	**Asthma Implemen-tation Research (AIRE)**	The Asthma Implementation Research (AIRE) study (2019–2020) was a hybrid type 2 effectiveness-implementation individually randomized controlled trial in low-resource communities in Lima, Peru, evaluating a locally adapted intervention to improve asthma self-management in children. A total of 110 child–caregiver dyads were enrolled, with 101 completing follow-up (five losses: three control, two intervention). The intervention group received additional support from a nurse manager via monthly home visits and ongoing phone/text access over six months. Both groups received physician-prescribed inhaled corticosteroids free of charge (Effectiveness and implementation of a multi-faceted intervention to facilitate adoption of asthma self-management practices in Peruvian children and adolescents- a hybrid type 2 individually randomized controlled trial)	Both arms of the study showed improvements in asthma control, treatment adherence, child and caregiver quality of life, and caregiver depressive symptoms, with the greatest gains between baseline and one-month follow-up. These improvements were likely largely driven by providing controller medications free of charge to both groups, delivered to homes, addressing financial and physical access barriers	Implementation Research
	Breathe Well South America	A 4-year research program (2024 onwards) funded by the NIHR (building on a £2 million Global Health Research Group) co-led with the Universidad Científica del Sur (UCSUR) in Peru. Starting in July 2024, it aims to assess primary care, develop a set of COPD quality indicators, and test the feasibility and cost-effectiveness of a new identification and treatment pathway for COPD patients (Experts aim to improve identification and treatment of COPD patients in South America - University of Birmingham)	N/A	Implementation Research
Peru (among others)	**Global Excellence in COPD outcomes**	A pilot effectiveness-implementation randomized field trial (2018–2020) evaluated a one-year CHW-supported self-management intervention for individuals with COPD grades B–D in low-resource settings in Nepal, Peru, and Uganda. A total of 239 participants were randomized to the control (119) or intervention arm (120), including 40 from Peru (20 per arm). The control arm received basic COPD education from a CHW and free access to medications for acute exacerbations at designated clinics or pharmacies, with study teams ensuring consistent availability across sites (Chronic Obstructive Pulmonary Disease Self-Management in Three Low- and Middle-Income Countries: A Pilot Randomized Trial)	The trial found no evidence of differences in respiratory health quality of life between the intervention and control arms. Additionally, moderate to severe exacerbations were more commonly documented in the intervention arm, suggesting the strategy is not warranted for a larger trial	Implementation Research

SOURCE: In-line with text; Team analysis

Tanzania: Inhaled medicines initiatives

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Tanzania (among others)	**International Multi-disciplinary Programme to Address Lung Health and TB in Africa (IMPALA)**	An applied global health research program (2018) that sought to improve existing CRD diagnostic capacity and care by providing spirometry and peak flow meters to health facilities and starting new CRD clinics in the country. IMPALA was commissioned and funded by UK aid. IMPALA spans 11 partner countries in Africa (Key stakeholders' perspectives on prioritization of services for chronic respiratory diseases (CRDs) in Tanzania and Sudan: Implications in the COVID-19 era)	The deployment of these resources was interrupted by the COVID-19 pandemic; diagnostic work using the newly provided spirometry and peak flow meters was suspended for infection control reasons. Additionally, they had to stop operating the CRD clinics as resources were diverted to control infection and manage potential COVID-19 patients	Implementation Research



SOURCE: In-line with text; Team analysis

Other countries: Inhaled medicines initiatives

COUNTRIES	NAME	DESCRIPTION	INFO ON OUTCOMES IF AVAILABLE	INITIATIVE TYPE
Other countries: Vietnam	**VCAPS study**	A program (2017-2022) designed to evaluate the effectiveness of interventions that manage chronic lung disease and smoking cessation at the primary health care level (specifically targeting district hospitals and medical centers) and to integrate asthma and COPD treatment programs into existing health services (VCAPS study – strategy for prevention of chronic lung disease and smoking cessation)	Initial assessments from both patients and medical staff showed the integrated approach to be feasible and well-supported by local doctors	Implementation Research
Other countries: Brazil	**Farmácia Popular Program (Brazilian National Medicines Access Program)**	An initiative by the Brazilian Public Health System (SUS) launched in June 2011 to provide asthma medications (including beclomethasone, ipratropium bromide, and salbutamol) completely free of charge to patients through a network of 554 government-managed drugstores and 20,374 contracted private drugstores (Free asthma medications reduces hospital admissions in Brazil (Free asthma drugs reduces hospitalizations in Brazil))	Asthma hospitalization rates fell by 34%, from 90.09 per 100,000 (2008–2010) to 59.85 (2012–2014). Household asthma costs dropped from 29% to 2% of income. Access expanded significantly, with 513% more patients reached (from ~67,000 in 2012 to 344,000 in 2015)	Scale (Country-level roll-out)
Global initiative including Benin, China, El Salvador, and Sudan	**Asthma Drug Facility (ADF)**	The International Union Against Tuberculosis and Lung Disease (The Union) established the Asthma Drug Facility in 2005 to improve access to affordable, quality-assured inhalers through pooled procurement, prequalification, and competitive pricing. It also provided technical assistance to strengthen asthma management within health systems, including drug storage and distribution (The availability, cost, and affordability of essential medicines for asthma and COPD in low-income and middle-income countries: a systematic review)	Despite a high burden of asthma, the Asthma Drug Facility's provision of low-cost inhalers struggled due to limited demand, even though users experienced significant reductions in asthma-related emergencies. The program was ultimately discontinued in 2013, driven by low uptake, limited political commitment, and a lack of robust local disease management strategies.	Pooled procurement (Pilot)

SOURCE: In-line with text; Team analysis

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