

The GASP Model

global access to sustainable pulmonology

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PAOLO CHIESI FOUNDATION

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Section 1

INTRODUCTION



The Paolo Chiesi Foundation is a philanthropic organization established in 2005 by Paolo Chiesi and his family, and operational since 2010, grounded in the belief that every person has the right to access quality healthcare and live a healthy life.

The Foundation's mission focuses on **improving health outcomes in the Global South**, with two main areas of intervention: reducing neonatal mortality in sub-Saharan Africa and strengthening the prevention, diagnosis, and management of chronic respiratory diseases (CRDs) in resource-constrained settings.

Through its programs, the Foundation supports local development initiatives and international scientific research aimed at transferring medical knowledge, strengthening healthcare systems, and empowering patients and families as active participants in the care process. In the respiratory field, it specifically works **to improve access to care for patients affected by CRDs**, particularly asthma and chronic obstructive pulmonary disease (COPD).

Within this framework, the Foundation plays a key role in the development, implementation, and scaling of the **GASP Model (Global Access to Sustainable Pulmonology)**, a structured and replicable approach designed to enhance the management of chronic respiratory diseases in resource-constrained settings.

Working in close collaboration with local institutions and international partners, the Foundation ensures that the Model is context-adapted, sustainably integrated into health systems, and continuously refined through field experience and data-driven evaluation.

Following its launch in Guyana in 2014, the Model was subsequently implemented by the Foundation in Peru in 2018, Nepal in 2023, and Uganda in 2026.



Section 2

EXECUTIVE SUMMARY

The **Global Access to Sustainable Pulmonology (GASP) Model** is a technical and capacity-building framework designed to improve the diagnosis, management, and sustainability of care for non-communicable chronic respiratory diseases (CRDs) — primarily asthma and chronic obstructive pulmonary disease (COPD) — in Global South countries, where these conditions represent a growing cause of morbidity, disability, premature mortality, and healthcare expenditure.

The GASP Model is conceived as a modular and progressive approach, intended to be adapted to diverse country contexts rather than implemented as a uniform package. While several components have already been implemented and tested in specific settings (e.g. Guyana, Peru, and Nepal), other elements are prospective and are intended to be integrated gradually, based on contextual priorities, feasibility, and available resources.

The Model draws on robust evidence showing that, in resource-limited settings, the effective management of CRDs — including timely diagnosis, appropriate treatment, and follow-up — is constrained by a set of interrelated systemic challenges, whose relevance varies across countries and levels of care. These challenges can include limited political prioritization and leadership, shortages of trained healthcare professionals, restricted access to essential diagnostic tools and medicines, inadequate health infrastructure, weak health information systems, and insufficient preventive and public health strategies.

Overall Objective

To improve the accessibility and quality of respiratory care in Global South countries, reducing disease burden and improving the quality of life of patients affected by CRDs and their families.

Framework Components

The GASP Model is structured around **four interconnected pillars, which can be implemented selectively and progressively according to local needs and system capacity**:



EDUCATION – Strengthening the competencies of healthcare professionals, promoting patient self-management, and increasing community awareness of CRDs.



FACILITIES & EQUIPMENT – Ensuring essential medical equipment, clinical protocols, and service organization to enhance diagnostic and treatment capacity through a Hub & Spoke model, ensuring appropriate referral pathways and continuity of care across levels of the health system.



DATA & RESEARCH – Standardizing and digitalizing data collection to promote data-driven clinical practice and strengthen evidence-based management of CRDs in resource-constrained settings.



ECOSYSTEM STRENGTHENING – Engaging institutional stakeholders at different levels —including governments and public health authorities, healthcare providers and professional associations, international organizations, academic and research institutions, private sector partners, and patient advocacy groups— is essential to support policy alignment, system integration, and long-term sustainability in CRD management.



Overall, the GASP Model represents **a replicable, scalable and adaptable framework** that integrates training, technological innovation, and health governance to reduce global respiratory health inequalities, while explicitly acknowledging the need for contextual adaptation, prioritization, and progressive implementation.

Disclaimer

The GASP Model is intended solely as a technical and capacity-building framework aimed at strengthening health systems and improving the management of chronic respiratory diseases. ***The Model does not constitute, directly or indirectly, any form of promotion, endorsement, inducement, or recommendation of Chiesi-branded medicinal products or any other pharmaceutical products.*** *Any reference to clinical practices, diagnostic tools, or therapeutic approaches is provided exclusively for educational and operational purposes and shall be interpreted as strictly non-promotional in nature.*



Section 3

CONTEXT & RATIONALE

3.1. The global burden of non-communicable chronic respiratory diseases (CRDs)

Non-communicable CRDs, primarily asthma and chronic obstructive pulmonary disease (COPD), are a leading global health challenge, causing significant mortality, disability, and economic burden. According to the **Global Burden of Disease (GBD) Study 2021**, chronic respiratory diseases (CRDs)—including COPD, asthma, pneumoconiosis, and other chronic respiratory conditions—were the f**ourth leading cause of mortality globally in 2021**, accounting for approximately **4.4 million deaths worldwide** (GBD 2021).

The burden of CRDs is disproportionately high in Low- and Middle-Income Countries (LMICs), where **nearly 90% of COPD deaths among people under 70 years of age occur** (WHO, 2026), reflecting a broader trend in non-communicable diseases: **WHO Global Health Estimates indicate that roughly 82% of premature NCD deaths happen in LMICs** (WHO, 2025). In these contexts, risk factors — such as **indoor and ambient air pollution**, **tobacco smoking**, **occupational exposure to dust and fumes**, and **recurrent respiratory infections** — are more prevalent and less controlled.

Key data:

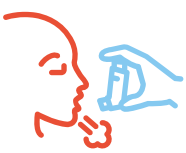
- **Global Burden:** CRDs were the fourth leading cause of death globally in 2021, responsible for ~4.4 million deaths (GBD 2021).
- **Asthma and COPD:** Asthma affected an estimated 363 million people and caused 442,000 deaths in 2023; COPD affected over 200 million people and caused 3.4 million deaths in 2023 (WHO, 2026).
- **LMIC Disparities:** Nearly 90% of COPD deaths **among people under 70 occur in LMICs**, driven by environmental exposures, smoking, and limited healthcare access (WHO, 2026).
- **Economic Burden:** CRDs impose high direct and indirect costs; cumulative global COPD costs are projected to approach US$ 40 trillion between 2025 and 2050 (Boers et al., 2025).
- **Access and Care Gaps:** In 2023, bronchodilator inhalers were available in public primary care facilities in less than two-thirds of low- and lower-middle-income countries, and steroid inhalers in less than half; diagnostic tools such as spirometry are also limited (WHO, 2026).



4.4 million
deaths caused by
Chronic respiratory diseases (CRDs)
worldwide in 2021

COPD affected
200+ million people
in 2023 and caused
3.4 million deaths





Asthma affected
363 million people
in 2023

3.1.1 **Association between Tobacco Smoking and CRDs**

Smoking is a major driver of chronic respiratory diseases (CRDs), strongly linked to both chronic obstructive pulmonary disease (COPD) and asthma. However, its relative contribution varies significantly across contexts.

In high-income countries, smoking accounts for a large proportion of COPD cases—estimated at up to 70%—as **tobacco smoke induces persistent airway inflammation, structural remodeling, and progressive lung damage** (WHO, Tobacco and COPD, 2023). Exposure to second-hand smoke similarly increases COPD risk and accelerates lung function decline.

In high-income countries, smoking accounts for over 70% of COPD cases, as tobacco smoke induces persistent airway inflammation, structural remodeling, and progressive lung damage (WHO, 2023). As a result, a substantial proportion of COPD cases in these settings occur among non-smokers, particularly among women exposed to indoor air pollution.

Smoking is also a well-established risk factor for asthma, with higher prevalence observed among smokers across age groups; women may be particularly susceptible at equivalent levels of exposure (WHO, Tobacco and Asthma, 2024). Among individuals living with asthma, smoking worsens symptoms, increases exacerbation frequency, and reduces responsiveness to inhaled corticosteroids.

Overall, while direct and indirect tobacco exposure remains a key determinant of respiratory health globally, effective CRD prevention and management in LMICs require addressing **a wider range of environmental, infectious, and socio-economic risk factors**.

3.1.2 **Prematurity as a Risk Factor for CRDs**

Premature birth disrupts normal lung development, placing infants at increased risk of respiratory complications from early life onward.

Many premature babies develop bronchopulmonary dysplasia (BPD), a chronic lung disease that particularly affects those born before 28 weeks of gestation or with very low birth weight. This condition results from a combination of lung immaturity and early postnatal injuries, including mechanical ventilation, oxygen exposure, and neonatal infections (Jobe & Bancalari, 2001; Baraldi & Filippone, 2007). BPD develops in approximately 40% of extremely preterm infants (<28 weeks) and in 20–40% of very low birth weight infants, with wide variation between centres (Higgins et al., 2018; Kardum et al., 2019). Nevertheless, preterm birth affects lung function even in the absence of BPD: preterm-born children without BPD have, on average, an FEV1 about 7 percentage points lower than term-born peers, compared with 16–19 points in those with BPD (Kotecha et al., 2013).

Lung Health Consequences - Both preterm infants **with and without BPD** are at a heightened risk of long-term respiratory morbidity. These include recurrent wheezing, persistent breathing difficulties, and reduced lung function that may extend into adolescence and adulthood (Baraldi & Filippone, 2007; Kotecha et al., 2013; Vollsæter et al., 2015). In addition to airflow limitation, preterm-born individuals frequently show **bronchial hyperreactivity, reduced exercise capacity, and airway dysanapsis**—a mismatch between airway size and lung volume—which contributes to obstruction and respiratory symptoms later in life (Clemm et al., 2018; Kotecha et al., 2018; Duke et al., 2018, 2022).

Premature infants additionally exhibit increased susceptibility to respiratory infections, leading to recurrent illness, hospitalizations, and further declines in lung function. **This vulnerability is especially pro-**

nounced in those with prior BPD but is observed across the preterm population.

Overall, the combination of lung immaturity, heightened infection risk, and potential neonatal lung injury **significantly elevates the likelihood of chronic respiratory diseases throughout the lifespan of individuals born preterm** (Stocks & Sonnappa, 2013).



3.1.3 Interaction Between Respiratory Infectious Diseases and Chronic Respiratory Diseases

Respiratory infectious diseases (RIDs), including tuberculosis (TB) and pneumonia from a spectrum of organisms, **are major contributors to the development and progression of chronic respiratory diseases (CRDs)** such as chronic obstructive pulmonary disease (COPD), bronchiectasis, and asthma.

Studies indicate that individuals with a history of TB have 2–3 times higher odds of having COPD, with stronger associations in high TB-burden countries and among never-smokers (Byrne et al., 2015; Fan et al., 2021).

Childhood pneumonia is associated with asthma and reduced lung function that can persist into adulthood (Stocks & Sonnappa, 2013).

Key Points

1. **Lung Tissue Damage:**
   TB and severe pneumonia from a variety of organisms can cause structural lung damage, including fibrosis, bronchial distortion, and airway obstruction, which may persist even after the infection resolves. This damage creates a predisposition for long-term respiratory dysfunction.

2. **Chronic Inflammation:**
   Recurrent or severe respiratory infections trigger prolonged inflammatory responses, leading to airway remodeling and increased risk of chronic respiratory morbidity.

3. **Interaction with Other Risk Factors:**
   Smoking, air pollution, and occupational exposures can exacerbate the impact of previous infections on lung health, accelerating progression toward CRDs.

3.1.4 **Effects of Climate Change on CRDs**

Climate change significantly affects respiratory health, increasing the burden of CRDs such as asthma and COPD (WHO, 2023; GOLD, 2025). Rising temperatures, extreme weather events, and poor air quality lead to higher exposure to pollutants, allergens, wildfire smoke, and ozone, all of which can trigger exacerbations and increase hospitalizations (Anenberg et al., 2018; GOLD, 2025). Both extreme heat and cold are associated with increased mortality and morbidity in people with COPD, with cold often posing a greater risk than heat (GOLD, 2025).

Indoor and outdoor conditions interact to influence outcomes: higher indoor temperatures and humidity can exacerbate heat effects, while insufficient heating in cold weather increases symptom severity. Behavioral and socioeconomic factors, such as window use, heating availability, and time spent indoors, modify individual exposure and vulnerability (GOLD, 2025). Population studies also show **synergistic effects between air pollution and extreme temperatures on hospital admissions and symptom exacerbations** (GOLD, 2025).

Climate change additionally affects pollen patterns and the spread of respiratory pathogens, increasing the risk of asthma exacerbations (Croft et al., 2025; GINA, 2025). Vulnerable populations, including children, the elderly, and those in low-resource settings, are particularly affected.

Addressing the health impacts of extreme temperatures and other climate-related exposures—such as maintaining safe indoor temperatures, ensuring adequate hydration, and considering the environmental impact of inhalers and healthcare facilities—remains essential to reduce the global burden of respiratory diseases (WHO, 2023; GOLD, 2025; GINA, 2025).



3.2. Challenges in CRD management in the Global South

The management of CRDs in resource-constrained settings is hindered by key systemic barriers, which may include inadequate healthcare infrastructure, shortage of trained healthcare staff, limited access to essential medicines and diagnostic technologies, and lack of epidemiological data. These limitations directly contribute to the observed challenges in CRD care: under-diagnosis and misdiagnosis, restricted availability of reliable health data, and limited access to both medical and non-medical treatments.

3.2.1. Under-diagnosis and misdiagnosis

Under-diagnosis and misdiagnosis of CRDs represent a significant global challenge, particularly in the Global South. These issues are closely linked to the **shortage of trained healthcare staff, limited availability of diagnostic technologies,** and **inadequate healthcare infrastructure**, which limit the capacity to perform timely and accurate diagnoses.

Studies suggest that up to 70% of chronic obstructive pulmonary disease (COPD) cases worldwide remain undiagnosed (Diab et al., 2018), with under-diagnosis rates varying from 10% to 95% and over-diagnosis rates ranging from 5% to 60% (Ho et al., 2019). Asthma presents a similar scenario, with many cases remaining unrecognized or misclassified.

Several factors contribute to this problem. **CRDs often manifest with non-specific symptoms that overlap with other conditions**, such as cardiac diseases, making early detection challenging. Limited clinical skills among healthcare providers exacerbate the issue, as insufficient training reduces the ability to correctly identify respiratory conditions. In addition, restricted access to modern diagnostic tools—including spirometry and imaging—hampers a timely and accurate diagnosis. These clinical and technological limitations are further compounded by political under-prioritization and inadequate funding, leading to incomplete data and low prioritization of CRDs in national health policies.

3.2.2. Limited availability of data

The lack of **digital health tools and systems**—such as electronic health records, hospital information systems, and clinical decision-support platforms - restrict the availability of standardized and structured clinical information, which is essential for effective chronic respiratory disease (CRD) management. In many settings, **reliance on paper-based record-keeping, fragmented systems, and the absence of common data standards** result in incomplete, inconsistent, and non-interoperable health records, impeding coordinated care and surveillance efforts (AbouZahr & Boerma, 2005; World Health Organization, 2025).

Paper-based workflows and limited adoption of electronic health record (EHR) systems remain common in resource-limited settings. A systematic review of e-health implementations in developing countries found that electronic systems can improve communication between facilities, medication management and the identification of patients at risk of loss to follow-up, and that mobile devices can improve the timeliness and quality of data collection (Blaya et al., 2010). Moreover, the lack of standardized and interoperable data formats across different health information systems **exacerbates fragmentation and restricts data sharing across providers, which is critical for longitudinal tracking of patients and public health planning** (World Health Organization, 2025).

Robust electronic medical records and data analytics can improve clinical documentation, enhance data completeness, support longitudinal patient tracking, and facilitate faster and more accurate clinical deci-

sion-making (Blaya et al., 2010). Conversely, the absence of such systems often leads to missing or inconsistent clinical measurements, limits epidemiological research, and hampers evidence-based policy and resource allocation (AbouZahr & Boerma, 2005). **In resource-constrained settings, infrastructure gaps, low digital literacy, and limited funding further hinder the adoption of scalable digital health solutions.**

Efforts to implement cost-effective, scalable digital solutions—such as locally adapted EHR systems and interoperable data standards—are ongoing. Collaboration between governments, international organizations, and private partners is critical to creating sustainable digital health ecosystems that improve data-driven decision-making and support evidence-based clinical practice (World Health Organization, 2022).

3.2.3. Limited access to medical and non-medical treatment

Limited access to essential medicines, compounded by **infrastructure weaknesses** and funding constraints, directly impairs the ability of patients to receive timely and effective treatment.

Patients and families face high out-of-pocket direct and indirect costs for medications, oxygen therapy, and other treatments, in addition to travel expenses to reach healthcare facilities. These financial and logistical barriers reduce adherence to therapy and worsen disease outcomes.

In addition, shortages of essential medications and limited availability of non-pharmacological interventions—such as pulmonary rehabilitation or patient education programs—further restrict the ability of patients to manage their conditions effectively.

Addressing these access barriers requires coordinated strategies that **combine financial support, infrastructure development, and expansion of local healthcare services to ensure equitable treatment for all patients**.

3.2.4 Public health and preventive medicine

In the Global South, addressing the growing burden of chronic respiratory diseases (CRDs) requires a combined approach that leverages both **public health** and **preventive medicine,** among other things. While public health focuses on **population-level interventions**, such as reducing environmental exposures and implementing vaccination campaigns, preventive medicine targets **individuals or high-risk groups**, emphasizing early detection, risk reduction, and management of established disease. Together, these complementary approaches are critical for reducing long-term morbidity and Disability-Adjusted Life Years (DALYs)—a measure that combines years of life lost due to premature death and years lived with disability—associated with CRDs, even in settings with limited resources.

PREVENTIVE STRATEGIES

Preventive medicine in the Global South focuses on primary, secondary, and tertiary prevention:

Primary prevention

- Reducing exposure to risk factors such as tobacco smoke, air pollution, and occupational hazards.
- Vaccination campaigns against respiratory pathogens (e.g., influenza, pneumococcus, RSV).
- Maternal health programs to reduce preterm births and improve neonatal outcomes.

Secondary prevention

- Early detection of CRDs through screening programs, particularly in high-risk populations (e.g., preterm infants, smokers).
- Monitoring and management of early lung function decline to prevent progression.

Tertiary prevention

- Strengthening access to evidence-based treatment for established CRDs, including inhaled therapies, pulmonary rehabilitation, and oxygen therapy.
- Integrated care models linking community health workers with primary care centers to improve adherence and outcomes.

Despite the potential of these strategies, implementation is often hindered by:

- **Resource limitations:** Many regions lack sufficient diagnostic tools (spirometry, imaging) and specialized healthcare providers.
- **Health inequities:** Socioeconomic disparities exacerbate exposure to risk factors and limit access to care.
- **Data scarcity:** Inadequate epidemiological data hampers planning and resource allocation.

In this context, strengthening **public health infrastructure** and prioritizing **preventive medicine** are indispensable. Even with constrained resources, synergistic strategies at the population and individual levels can substantially reduce the burden of CRDs, improve health outcomes, and mitigate disparities in the Global South.

3.3. The need for an integrated and sustainable model

Addressing CRDs in resource-constrained settings requires a Model that:

- combines **training, infrastructure, data collection and management, advocacy, prevention and access to care** within a coherent framework;
- is **scalable and adaptable** to national priorities and available resources;
- promotes **local sustainability** through capacity building and system integration;
- fosters **collaboration among institutions, academia, and civil society**.

The **GASP Model** responds to these needs by providing a structured intervention platform that integrates clinical, organizational, and digital components to improve the quality of respiratory care in Global South countries.

3.4 Alignment with Global and National Standards and Frameworks

The GASP Model is fully aligned with leading international frameworks and clinical standards for chronic respiratory disease care. It builds on core guidance from the World Health Organization (WHO) and major global health alliances, ensuring that all interventions are evidence-based, scalable, and suitable for resource-constrained settings.

GASP operationalizes key principles from the **WHO Package of Essential Noncommunicable Disease Interventions (PEN)** and the **WHO PEN-Plus strategy**, including task-sharing, decentralized service delivery, and context-adapted care pathways for integrated NCD management.

In addition, GASP is aligned with the **Global Alliance against Chronic Respiratory Diseases (GARD)** and supports the priorities outlined in the **WHO Global Action Plan for the Prevention and Control of NCDs 2013–2030**, particularly early detection, patient empowerment, and equitable access to quality care.

Crucially, GASP incorporates clinical guidance from the **Global Initiative for Asthma (GINA)** and the **Global Initiative for Chronic Obstructive Lung Disease (GOLD)**, ensuring adherence to internationally recognized diagnostic and treatment standards while adapting them to resource-constrained settings.

The Model also leverages practical tools and primary-care guidance from the **International Primary Care Respiratory Group (IPCRG)**, including patient education, inhaler technique support, and pragmatic diagnostic approaches where spirometry access is limited. Furthermore, GASP is designed to align with **national health policies and strategic frameworks** in each country of implementation — such as Guyana, Nepal, Peru, and Uganda — ensuring complementarity with existing Noncommunicable Disease (NCD) and Primary Healthcare strategies and promoting ownership and sustainability within local health systems.

Through this alignment, GASP ensures that its interventions remain globally coherent, scientifically grounded, and integrated within national priorities — while retaining the flexibility needed to operate effectively in diverse and resource-limited environments.

Section 4

THE GASP MODEL



4.1 Background of the Model

The Model was developed in 2014, originating from a pilot project in Guyana led by Professor Robert Levy from the University of British Columbia, Canada. He later began a systematic collaboration with the Paolo Chiesi Foundation (formerly Chiesi Foundation). Over the years, the Model has evolved to include a wide range of interventions beyond spirometry, which remains a central element for diagnosis of CRDs. **Currently, the Foundation supports the implementation of elements of the Model in Guyana, Peru, Nepal, and Uganda**. The framework presented in this document combines both activities already implemented in these contexts and components planned for future integration.

4.2 Criteria for Prioritization and Implementation

The GASP Model is designed to support country-led strengthening of respiratory care systems through a **selective and progressive implementation** of its components. The selection, sequencing, and scope of GASP interventions are guided by a set of explicit prioritization criteria, jointly applied with national and local stakeholders.

Key criteria include:

- **Burden of chronic respiratory diseases**, including prevalence, severity, and impact on morbidity, mortality, and health system utilization at national or subnational level;
- **Identified gaps in diagnostic and clinical capacity**, such as shortages in trained healthcare professionals, limited availability of essential diagnostic tools, or operational constraints at different levels of care;
- **Alignment with national health policies and strategies**, ensuring coherence with existing plans, guidelines, and priorities, and avoiding duplication;
- **Long-term sustainability and domestic resource mobilization**, including the potential for institutional integration, progressive government ownership, and financial sustainability beyond external support.

These criteria ensure that GASP implementation decisions are **evidence-informed, context-appropriate, and realistic**, enabling countries to prioritize essential components while progressively strengthening more advanced capacities as systems mature. Importantly, the application of these criteria implies that not all pillars or components of the GASP Model are expected to be implemented in every context. **In low-resource settings, priority is placed on essential interventions with the highest potential impact, while more advanced components are considered only where feasibility and sustainability conditions are met**.

4.3 The Four Pillars of the GASP Model

The GASP Model is built around four interdependent pillars that together address the main barriers to diagnosis, treatment, data management, and sustainability of care for chronic respiratory diseases (CRDs) in resource-constrained settings. Each pillar is supported by practical implementation tools — including templates, clinical tools, training packages, operational checklists, and monitoring systems — provided as annexes **to facilitate rapid deployment and ensure quality across diverse contexts**.

The four pillars are:



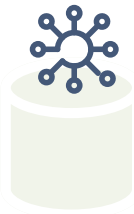
EDUCATION – Strengthening the capacity of healthcare professionals (HCPs), empowering patients, and fostering a culture of continuous professional development in respiratory medicine. This pillar includes training pathways for different professional profiles, patient self-management programs, family engagement, and community awareness initiatives.



DATA & RESEARCH – Promoting data-driven clinical practice, digital transformation, and locally led operational and clinical research. This pillar supports structured data collection, digital patient registries, monitoring of key indicators, and evidence generation for continuous quality improvement and policy advocacy.



FACILITIES & EQUIPMENT – Ensuring that healthcare facilities have trained personnel, essential medical equipment, functional spaces, and standardized clinical protocols. This pillar emphasizes tiered service delivery through a Hub & Spoke model, and progressive introduction of diagnostic capabilities appropriate to facility level.



ECOSYSTEM STRENGTHENING – Ensuring sustainability of respiratory care programs through active engagement of partners, policy alignment, and cross-country knowledge exchange. This pillar fosters multi-level collaboration, policy integration, and global dissemination of lessons learned and best practices.

Collectively, these pillars aim to reduce the burden of CRDs, improve patient outcomes, and strengthen health system resilience in resource-constrained settings.

Note: *While each pillar is described in detail in this document, the operational tools are provided as separate annexes to support practical implementation, adaptation, and replication across different settings.*



Pillar 1: EDUCATION

Goal

To strengthen the capacity of healthcare professionals (HCPs), empower patients, and build a culture of continuous professional development in respiratory medicine.

A. Healthcare Professional Capacity Building

Capacity building is a core component of the GASP Model, aimed at ensuring essential competencies for safe and effective diagnosis, management, and follow-up of asthma and COPD across care levels. The training is modular, competency-based, and adaptable rather than a uniform curriculum. Pathways are tailored to professional profiles, facility capacities, and local health system maturity. Selection, sequencing, and depth of modules are guided by local priorities and available resources.

The GASP Model emphasizes verification of competencies through structured mentorship, supervision, checklists, observation tools, and practical assessments. **While GASP does not provide official certification, these tools help local institutions validate skills in line with national regulations.** Formal accreditation and certification remain the responsibility of local regulatory bodies. GASP focuses on developing adaptable educational materials, teaching methodologies, and supervision structures that can be embedded into routine service delivery for long-term sustainability.

A.1 TRAINING TRACKS – REFERENCE PATHWAYS

GASP provides training materials, pedagogical approaches, mentorship frameworks, and supervision structures that can integrate into existing national and institutional training systems. The Model supports task-shifting, knowledge cascading, and sustainable service delivery. Didactic content is concise and complemented by mentorship, on-the-job supervision, and simplified clinical tools.

The following tracks illustrate high-level pathways for adaptation, not prescriptive training packages.

A.1.A PULMONOLOGIST TRACK

This track is designed for trained pulmonologists who already possess core clinical competencies in respiratory medicine. Within the GASP Model, their role is primarily to act as **clinical leaders, mentors, and referral specialists**.

Objectives

- Strengthen advanced diagnostic and management skills for complex CRD cases.
- Enhance mentorship and supervision capacity for other healthcare providers.
- Support quality of care through adherence to international guidelines.
- Foster clinical leadership and contribution to service development and scale-up.

Core Training Components

- Advanced Clinical Case Discussions and Grand Rounds on complex cases, differential diagnosis, and multidisciplinary decision-making.
- Regular sessions on guideline updates and evidence review on GINA/GOLD updates and emerging evidence.
- Leadership and Service Development to lead CRD services, support implementation, and train others.

A.1.B GENERAL PRACTITIONER (GP) TRACK

This track targets general practitioners, who manage a broad range of conditions and require focused strengthening of CRD-specific competencies.

Objectives

- Improve early diagnosis and differentiation of common CRDs.
- Reinforce guideline-based management and rational prescribing.
- Strengthen follow-up and long-term patient management.
- Improve coordination with specialists and referral systems.

Core Training Components

- Clinical Seminars on CRD Diagnosis and Management.
- Real-world cases to strengthen clinical reasoning and decision-making.
- Hands-on Clinical Training in respiratory assessment, spirometry (where available), and patient management.
- Training on patient monitoring, adherence, and long-term care pathways.

A.1.C FRONTLINE HEALTHCARE WORKERS TRACK

This track targets Nurses, Community Health Workers (CHWs), and other frontline Healthcare Professionals (e.g., auxiliary nurses, laboratory technicians, social workers).

Objectives:

- Recognize early CRD symptoms and risk factors.
- Promote timely referral and care coordination.
- Support patient education, adherence, and behavior change.
- Provide basic clinical monitoring and support within their scope of practice.

Core Training Components

- Introductory modules on CRDs (asthma, COPD, common respiratory conditions).
- Patient education and counseling (household- or community-level).
- Referral and care coordination protocols.
- Basic respiratory assessment and monitoring (e.g., respiratory rate, SpO_2, oxygen therapy principles where available).
- Supportive role in care continuity and follow-up.

B. Patient self-management & Family Engagement

Empowering patients and caregivers is critical to improving long-term outcomes in chronic respiratory diseases (CRDs). Through education, patients gain the knowledge and skills needed to understand their condition, adhere to treatment, and prevent exacerbations.

The patient education component of the GASP Model focuses on building self-management skills and promoting behavioral change through practical and accessible tools.

- **Risk Factor Prevention and Management:** Education should address major preventable risk factors such as tobacco use, indoor and ambient air pollution, and occupational exposure. Emphasis should be placed on **smoking cessation**, offering guidance and motivation for patients who smoke, supported by tailored counseling where feasible. Vaccinations, including influenza and pneumococcal vaccines, should be promoted to reduce lower respiratory tract infections and exacerbations in patients with COPD and asthma.

- **Inhaler Technique Training:** Practical demonstrations help patients master correct inhaler use. Training sessions should be supported by visual aids and pictorial instructions available in local languages in a culturally appropriate fashion to ensure com-

prehension and adherence. Frequency and quality of patient training will be tailored to local environments, although the Paolo Chiesi Foundation global aim is to align them with internationally recognized guidelines to assure the highest quality possible.

- **Monitoring Disease Progression:** Patients should be taught how to recognize and track changes in symptoms and disease control. This can be supported by:
  - **Patient Diaries:** simple and easy-to-use tools for recording symptoms, medication intake, and triggers. Diaries also serve as a communication bridge between patients and healthcare providers, improving follow-up and continuity of care.
  - **Portable Technologies for Self-Management:**
    - **Peak Flow Meter**: A basic, low-cost device that allows patients to monitor lung function at home, helping identify early changes in disease control.
    - **Digital or Mobile Solutions**: Where feasible, apps, SMS reminders, or Bluetooth-enabled devices can support symptom tracking, medication reminders, pulmonary function monitoring, and educational tips. These tools enhance self-management, particularly among younger or tech-savvy patients.

Patient education should be **integrated into routine clinical practice**, with sessions facilitated by **nurses or trained educators**.

Depending on the context, education can be delivered through **individual counseling, group sessions, or a combination of both**, ensuring flexibility and accessibility for all patients.

An important aspect of patient education is **family engagement and support**.

Involving family members in patient education is essential, particularly for patients who may require assistance with medication adherence, inhaler technique, or lifestyle modifications. Families can reinforce learning, help monitor symptoms, and provide emotional support, which contributes to better disease management and long-term outcomes.

Education for family members should cover:

- Recognition of early warning signs of exacerbations.
- Proper support for medication administration and inhaler use.
- Encouragement of behavioral changes, such as smoking cessation and avoidance of environmental triggers.
- Communication with healthcare providers to ensure continuity of care.

Integrating family education into routine practice, either alongside patient sessions or in separate workshops, ensures that the patient's support system is empowered to actively participate in disease management, fostering a more holistic approach to chronic respiratory care.

C. Community Awareness

The objective of this component is to enhance **community-level understanding of CRDs, with a focus on prevention and early detection**. Prevention efforts will target key risk factors, including tobacco use, indoor and ambient air pollution, and occupational exposures.

Planned activities can include:

1. **Activities targeting the general community:**
   a) **Mass awareness campaigns** through multiple channels tailored to workers, including social media, radio, community meetings, and engagement with workplace influencers.
   b) **Community meetings and public events** to sensitize community members, tailored to local contexts and cultural norms.
   c) **Educational campaigns and sensitization events** in schools to raise awareness of CRD risk factors and promote healthy behaviors from an early age.

2. **Activities targeting at-risk workers and specific population subgroups:**
   a) **Occupational screening programs for early detection of CRDs** among workers exposed to respiratory hazards.
   b) **Workplace training sessions** to promote preventive practices and recognize early symptoms of CRDs.



Pillar 2: FACILITIES & EQUIPMENT

Goal

To ensure equitable access to high-quality diagnostic and treatment services for asthma and COPD through a tiered Hub & Spoke approach, with human resources, medical equipment, infrastructure, and clinical protocols structured to support its effective implementation.

A. Hub & Spoke Model

The **Hub & Spoke Model** forms the backbone of the GASP system, ensuring equitable access to quality diagnosis and care through a tiered service delivery structure:

- **Hub (specialist referral centers, e.g., tertiary hospitals)**
  Main functions: advanced diagnostics, training, research, mentoring, and supervision of Spokes.

- **Spokes (primary or district-level facilities, e.g., community health centers or satellite clinics)**
  Main functions: screening, basic diagnosis, initial management, patient follow-up, and coordination of referrals to the Hub.

This approach guides the allocation of human resources, equipment, and clinical protocols: each level has roles, competencies, and tools tailored to its function, ensuring efficiency and continuity of care.

B. Human Resources

Adequately trained personnel are essential for delivering safe and effective diagnostic and treatment services for asthma and COPD. The GASP Model identifies key professional roles and core competencies across the care continuum, aligned with the tiered Hub & Spoke approach:

- **Primary-level facilities**: general physicians, nurses, and Community Health Workers (CHWs) provide decentralized screening, basic diagnosis, management, and patient follow-up.
- **Secondary or district-level facilities**: include technicians and staff with expanded diagnostic competencies to support more complex case assessment.
- **Tertiary or referral centers**: specialist physicians and personnel trained in advanced diagnostics, research, and mentoring of Spokes.

The Model recognizes the main human resource challenges in healthcare facilities, including **limited staffing, high turnover, and workforce burnout**. To address these, it promotes **adaptable strategies tailored to each context**, emphasizing **continuous professional development and ongoing training**. By investing in the skills and competencies of existing personnel, the Model reduces vulnerability to transfers or attrition while maintaining essential capabilities for asthma and COPD care across all levels.

Priority is placed on ensuring **minimum essential competencies**, rather than requiring specialized staff at every facility, in line with the modular and progressive nature of the GASP framework. This tiered approach also supports task-sharing, efficient use of available human resources, and continuity of care within the Hub & Spoke network.

C. Medical Equipment and Space Requirements for Functional CRD Clinics

Effective management of asthma and chronic obstructive pulmonary disease (COPD) can be achieved in most settings using a **limited set of essential diagnostic tools, basic infrastructure, and access to essential medicines**.

Advanced diagnostic technologies are **not required for standard asthma and COPD care** and are not expected to be available in low-resource settings. For reference, optional or advanced tools are described in **Appendix 1 – Optional / Advanced Diagnostic Capabilities**.

ESSENTIAL EQUIPMENT FOR ASTHMA AND COPD CARE

These represent the **minimum core requirements** for functional asthma and COPD services at primary, district, and secondary levels:

1. **Diagnostic and Monitoring Tools**
   - **Spirometer** with basic calibration accessories – reference standard for COPD and asthma diagnosis and assessment.
   - **Disposable mouthpieces, nose clips, and filters** – to ensure infection prevention and test quality.
   - **Peak flow meter** – low-cost complement to spirometry, particularly in primary care and low-resource settings.
   - **Pulse oximeter (SpO_2)** – for basic clinical assessment and monitoring, including during acute exacerbations.
   - **Weighing scale and height measurement tool** (stadiometer or measuring tape) – for routine anthropometric assessment to generate predicted values.

2. **Basic Space Requirements**
   - **Clean, well-ventilated room** suitable for pulmonary function testing and patient assessment.

- **Basic infection prevention and control measures**.

3. **Data and Clinical Documentation**
   - **Basic computer or tablet** – enabling standardized patient records and minimal digital data collection (offline or online), plus a printer.

4. **Essential Medicines**
   - **Reliable availability of essential respiratory medicines**, aligned with WHO Essential Medicines List and GINA/GOLD recommendations.

D. Adoption and contextualization of standardized clinical protocols

In practice, GASP ensures the operationalization of international standards (such as GINA, and GOLD) through the development of **contextualized clinical tools**, **quality assurance systems**, and **integrated service delivery pathways** adapted to national realities.

At the clinical level, simplified **diagnostic and treatment algorithms** are developed from international guidelines and adjusted to the resources available at each level of care. These include **visual flowcharts for primary care, quick-reference pocket guides, and local-language versions of key protocols**.

All protocols are aligned with available medicines, infrastructure, and human resources, while being tailored to local languages, health-seeking behaviors, and cultural contexts to ensure accessibility and sustainability.



Pillar 3: DATA & RESEARCH

Goal

To promote **data-driven clinical practice** and **strengthen evidence-based Chronic Respiratory Disease (CRD) management** through systematic data collection, digital transformation, and locally driven operational research.

A. Data Collection, Analysis and Digitalization

The Model emphasizes the systematic collection of patient data as a **distinct but complementary activity to research**, forming the foundation for both clinical care and program evaluation. The Model promotes transitioning from paper-based systems to standardized digital tools—including harmonized clinical charts and electronic patient registries— ensuring that key information is captured consistently:

- patient demographics;
- medical and exposure history;
- diagnostic results (spirometry, imaging, laboratory);
- treatments, follow-up data, and clinical outcomes.

This transition aims also to strengthen **data governance**, improve data quality and accessibility, and enable analytical capacity across the health system. Importantly, all digital systems should be designed to comply with **data protection, privacy, and confidentiality standards**, ensuring secure handling, storage, and controlled access to patient information.

From a **clinical perspective**, structured and continuous data collection allows for:

- improved diagnostic accuracy through complete, retrievable clinical information at the point of care, reducing misdiagnosis and missed follow-ups;
- longitudinal patient tracking to monitor treatment response and disease progression in real time;
- support for clinical decision-making via dashboards and feedback loops that identify risk patterns, treatment gaps, and outcomes over time.

From a **programmatic perspective**, digital data systems:

- generate reliable key performance indicators (KPIs) such as diagnosis rates, treatment adherence, and follow-up;
- facilitate cross-site aggregation and comparative analysis to identify trends, evaluate intervention effectiveness, and demonstrate measurable impact;
- provide robust evidence for continuous quality improvement (QI), enabling timely identification of bottlenecks and adaptive responses.

To ensure sustainability, data officers and clinical staff receive training in **accurate data entry, quality assurance, basic analysis, interpretation**, and **data privacy and security**, fostering a culture of evidence-based decision-making across all levels of care.

B. Operational and Clinical Research

The Model promotes locally led research that is both **operational and clinical**, aiming not only to generate evidence for policy and practice but also to **drive continuous improvement in the quality of CRD care and service delivery**.

Data collected through clinical registries and routine service delivery activities form the foundation for:

- **Operational research** – evaluating the feasibility, acceptability, and effectiveness of CRD interventions, documenting best practices, identifying barriers to scale-up, and informing strategies to improve service quality.
- **Clinical research** – analyzing disease patterns, treatment outcomes, and comorbidity profiles, with a focus on improving patient care quality and clinical decision-making.

Research findings are then **used transversally to enhance quality** by:

- integrating evidence into training curricula for continuous professional development;
- supporting advocacy for evidence-informed policies with Ministries of Health and partners;
- and disseminating results internationally through scientific publications, conference presentations, and open-access repositories.



Pillar 4: ECOSYSTEM STRENGTHENING

Goal

To ensure long-term sustainability of respiratory care programs through partner engagement, policy alignment and integration, and cross-country collaboration.

A. Stakeholder Engagement

GASP promotes active and structured engagement with stakeholders working at all levels of the health system and across sectors. It aims at connecting policymakers, clinicians, academia, civil society, and international partners around a shared vision for equitable respiratory care.

Through this multi-tiered engagement, the Model aims at **bridging the gap between local implementation and global policy**, ensuring that field experiences inform national strategies and global discussions alike.

Level	Stakeholders	Key Actions	Responsibility
Local / Health Facilities	Hospital leadership, department coordinators	- Strengthen institutional ownership - Support local “champions”	**Local partners:** direct implementation of clinical programs and identification of champions **Foundation:** technical support and training
Regional & National	Ministries of Health, NCD offices, professional societies, universities	- Establish national working groups to develop guidelines, protocols, and strategies - Integrate CRD care into national policies and strategies - Build academic collaborations to strengthen training and research capacity	**Local partners:** local advocacy and collaboration with authorities **Foundation:** strategic guidance, sharing evidence and tools, supporting networking
Global / International	UN agencies, international NGOs, donors, global networks	- Align GASP activities with global priorities - Participate in multi-stakeholder forums and consultations - Share evidence and best practices	**Local partners:** collect and produce local evidence and field experience **Foundation:** global advocacy, international representation, coordination of partner network

B. Cross-Country Cooperation and Knowledge Exchange

GASP aims at establishing a **dynamic network of countries and partners** that share common challenges and co-develop scalable solutions for respiratory care in resource-constrained settings. It promotes **South–South and South–North exchange**, ensuring mutual learning despite linguistic, geographic, and infrastructural diversity.

Main mechanisms include:

1. **Virtual Exchange Activities**
   a) Country Spotlights: Each country shares one local innovation, lesson learned, or case example in a short virtual session.
   b) Expert Webinars: International experts provide updates and practical guidance on CRD care.
   c) Peer Discussions: Small online groups of professionals from different countries discuss challenges, share experiences, and review tools or protocols together.

2. **In-Person Exchange Visits**
   a) Reciprocal country visits to observe implementation firsthand and strengthen institutional collaboration.

Through these mechanisms, GASP aims at creating a **learning community** that transforms local experiences into shared global knowledge, amplifying the initiative's visibility and influence in international fora.

C. Advocacy

The GASP Model recognizes the **persistent under-prioritization of chronic respiratory diseases (CRDs) within global and national health agendas**. While the Model is not designed to directly address systemic funding gaps or lead large-scale advocacy efforts, it aims to contribute to increased visibility of CRDs by generating structured data from implementation sites, supporting evidence-based dialogue, fostering collaboration among stakeholders, and strengthening the case for increased attention to CRD care.

Through engagement with national health authorities, professional networks, and implementing partners, **the Model can facilitate policy dialogue and help align CRD management with broader non-communicable disease (NCD) strategies**. In this way, GASP may indirectly support advocacy efforts and contribute to more informed priority-setting and resource allocation processes.

Key priorities include:

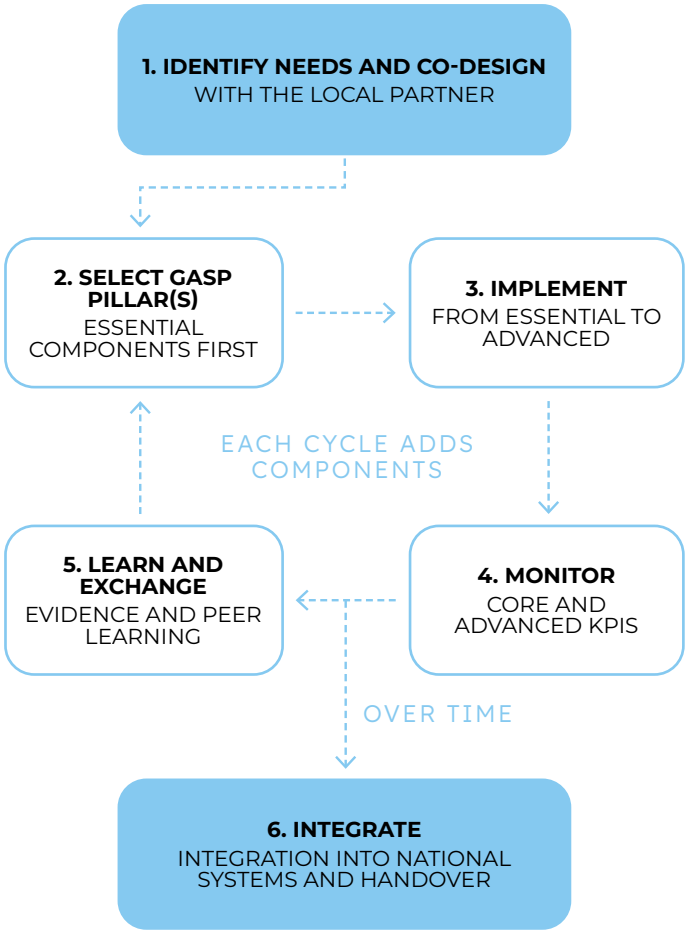
- integrating CRD prevention, diagnosis, and treatment into primary healthcare packages and national NCD plans and strategies;
- supporting the inclusion of respiratory health within national and subnational budgeting processes;
- promoting the inclusion of essential respiratory medicines and devices in national formularies and procurement lists;
- supporting environmental and occupational health policies that address major CRD risk factors (e.g., air pollution, biomass exposure, tobacco).

4.4 How the GASP Model is implemented

The GASP Model is implemented through a pathway that starts from local needs and partners and ends with the integration of respiratory care into the national health system. Between these two points, the Model grows step by step: in each cycle, new components are selected, implemented, monitored, and refined, moving progressively from essential to advanced interventions.

GASP IMPLEMENTATION PATHWAY: 6 STEPS, ONE REPEATING CYCLE

GASP grows step by step, from co-design to integration



Steps 2 to 5 form a cycle that repeats as the program matures. Integration into the national health system is the final step, but it is pursued from the very beginning.

Step 1. Identify needs and co-design with the local partner

- **WHAT:** the local partner and the Foundation jointly identify needs and design the respiratory care intervention and its workplan, building on what already exists.
- **HUB & SPOKE:** partners design the Hub & Spoke model described in Pillar 2. They choose the hub, usually a referral hospital with specialist staff, which confirms diagnoses, manages complex cases, assures the quality of spirometry tests, and trains and supervises the spokes. They choose the spokes, primary or district-level facilities that screen patients, make a first diagnosis where possible, start treatment, follow patients over time, and refer them to the hub when needed. They also define catchment areas, minimum standards for each level, and referral pathways.
- **WHAT MAKES IT GASP:** the local partner leads, and the Foundation accompanies; the intervention builds on existing structures and initiatives, avoiding parallel systems; and health authorities are involved from the start, because integration into the health system is the final goal.

Step 2. Select GASP pillar(s)

- **WHAT:** once the intervention is designed, the partners select which pillars and components to activate, in which order and in which facilities, following the criteria described in section 4.2.
- **HUB & SPOKE:** in later cycles, the model can be extended to further spokes and, once diagnostic capacity allows, to the community level, for example through community health workers.
- **WHAT MAKES IT GASP:** the guiding rule is not to create demand that health services cannot yet meet. For example, community screening is introduced only when facilities can confirm diagnoses and essential medicines are available. Advanced components are added only when the essential ones are working, as shown by the core indicators.

Pillar	Essential components	Advanced components
Education	Training of healthcare professionals by level; patient self-management education	Community awareness campaigns, occupational screening, school activities
Facilities & Equipment	Spirometer, peak flow meter, pulse oximeter, clinical protocols, Hub & Spoke network	Advanced diagnostic tools (Appendix 1)
Data & Research	Standardized clinical records, core indicators	Digital patient registry, operational and clinical research
Ecosystem Strengthening	Engagement of health authorities, agreements with facilities	Integration into national policies, advocacy, cross-country exchange

Step 3. Implement

- **WHAT:** the selected components are put into practice, starting from the hub and a first group of spokes, and extending to further spokes in later cycles.
- **HUB & SPOKE:** referral and counter-referral pathways are activated, so that patients move up to the hub when needed and back to the spokes to be followed close to home, while knowledge moves from the hub to the spokes through mentoring.
- **WHAT MAKES IT GASP:** training is not a one-off course, but a pathway combining didactic content, mentorship, and on-the-job verification of competencies; and the hub is not only a referral center, but also trains and supervises the spokes.

Step 4. Monitor

- **WHAT:** the partners check whether services are working and whether patients benefit from them.
- **WHAT MAKES IT GASP:** the two-tier KPI system, core and advanced, avoids overburdening the most fragile settings; and data are used for improvement, not only for reporting.

Step 5. Learn and exchange

- **WHAT:** experience and data are turned into shared learning, which improves the program and, over time, the Model itself.
- **WHAT MAKES IT GASP:** improved practices and tools, evidence to inform the next cycle and national policies, and results shared through scientific publications and conferences.

Step 6. Integrate

- **WHAT:** respiratory care services, including the Hub & Spoke model, become a stable part of the national health system, and responsibility is progressively handed over to local institutions.
- **WHAT MAKES IT GASP:** integration is not only the last step, but a goal pursued from the very first workshop; and it is measured through specific indicators, such as the number of national policies including CRD care, and the share of program costs covered by domestic funding.



Section 5

GASP MODEL THEORY OF CHANGE

5.1 GASP Theory of Change

The Global Access to Sustainable Pulmonology (GASP) Theory of Change describes the logical pathway through which targeted interventions across the four GASP pillars lead to sustainable improvements in chronic respiratory disease (CRD) care in resource-constrained settings.

1 IF

- healthcare professionals receive adequate and continuous training,
- patients and communities are empowered to manage and prevent respiratory conditions,
- healthcare facilities are equipped with essential diagnostic tools and have reliable access to essential medicines, and functional data systems,
- and national stakeholders are engaged to institutionalize respiratory care within NCD frameworks,

2 THEN

- diagnostic accuracy, treatment adherence, and continuity of care are expected to improve,

3 LEADING TO

- more equitable access to adequate respiratory care across populations,
- and potential reductions in exacerbations, hospitalizations, and premature morbidity associated with CRD,

4 THEREFORE

- contributing to strengthening a resilient and equitable respiratory care system that ensures access to sustainable, high-quality services for all populations.

Assumptions

- Ministries of Health adopt GASP-aligned protocols and allocate funding.
- Trained HCPs remain in post and cascade training locally.
- Facilities maintain the functionality of the equipment provided and ensure a consistent supply of essential medicines.
- Patient engagement improves adherence.
- Improved awareness among community members reduces exposure risks.
- Data systems are interoperable and supported by national ICT structures.

Risks

- **Limited political will or competing national priorities**, which can affect funding, support and sustainability for CRDs programs;
- **High staff turnover or reallocation**, potentially disrupting continuity of care and program implementation.
- **High cost of medicines and diagnostic tests**, creating barriers to access, reducing treatment adherence, and potentially undermining overall program effectiveness.
- **Supply chain interruptions for medicines and equipment**, which may limit timely access to essential treatments and diagnostics.

5.2 Key Performance Indicators (KPIs)

To verify that interventions in these areas produce the desired effects, the GASP Model has defined SMART indicators covering **process/output**, **outcome**, and **impact** dimensions. It adopts a flexible and scalable monitoring approach. While data collection is essential to ensure quality and impact, not all indicators are required in every country or implementation site.

To balance rigor with feasibility, the Model defines two types of KPIs:

- **Minimum Core KPIs**, required across all programs to measure GASP implementation fidelity and impact. The Core KPI package includes at least one indicator per pillar at the process, outcome, and clinical improvement levels. This ensures that even in low-resource settings, the Model can demonstrate changes in quality of care and patient benefit, not only activities.
- **Advanced/additional KPIs**, recommended where data systems and capacity allow.

This tiered approach supports equity, avoids data burden, and **encourages progressive strengthening of health information systems**. The objective is not data collection for its own sake, but data for improvement. Programs start with a minimum core and progressively expand according to national priorities, capacity and health information systems — building sustainable data culture over time.

Type	Level	GASP Pillar	Description	Indicator	Data Source
Core	Output	Education (HCP)	Strengthen provider competence in CRD management	Number of trained HCPs	Training records/ Facility survey
Core	Outcome	Education (HCP)	Strengthen provider competence in CRD management	% of trained HCPs passing post-training assessment/ % of Knowledge Retention Rate	Training records
Advanced	Outcome	Education (HCP)	Strengthen provider competence in CRD management	HCP retention in CRD services	Facility records
Advanced	Output	Education (Patient)	Improve patient awareness	% of patients able to identify main symptoms and triggers	Patient survey
Core	Outcome (behavioral)	Education (Patient)	Improve adherence and self-management	% of patients demonstrating correct inhaler use	Observation checklist during visit
Core	Outcome (clinical)	Education (Patient)	Improve adherence and self-management	% of patients with improved symptom control (CAT/ACQ score)	Patient diaries, Clinical note, Patient Reported Outcomes (PRO)
Core	Intermediate impact	Education (Patient)	Improve patient quality of life	Mean score improvement in validated questionnaires (e.g., CAT, ACQ, SGRQ)	Patient diaries, PRO
Advanced	Impact	Education (Patient)	Reduce avoidable hospitalizations (proxy)	Reduce average number of exacerbations per patient/ year	Patient diaries, Hospital records

Type	Level	GASP Pillar	Description	Indicator	Data Source
Core	Output	Education (Community)	Raise community knowledge about CRD	# of awareness sessions conducted in the community / # of brochures, posters, or digital materials distributed	Project records
Advanced	Outcome	Education (Community)	Improve community understanding of CRD symptoms and risk factors	% of community members correctly identifying key CRD symptoms and risk factors	Community survey
Advanced	Intermediate impact	Education (Community)	Promote early healthcare seeking	% of community members reporting intention to seek care when symptoms appear	Community survey
Core	Output	Facilities & Equipment	Expand diagnostic capacity	# of functional spirometers/ facility	Facility inventory/ Project records
Core	Outcome	Facilities & Equipment	Ensure standardized practice (quality of care)	% of facilities applying adequate CRD protocols (GINA/GOLD aligned)	Facility audit/ Project records
Core	Output	Facilities & Equipment	Establish functional hub–spoke networks	# of active spoke facilities formally linked to each hub	Project records
Advanced	Outcome	Facilities & Equipment	Establish functional hub–spoke networks	% of facilities with documented referral protocols between hub and spokes	Facility audit/ Referral logs
Core	Outcome	Facilities & Equipment	Establish functional hub–spoke networks	% of spoke sites receiving ≥1 supervisory/mentoring visit per year from hub	Project Records
Advanced	Impact	Facilities & Equipment	Establish functional hub–spoke networks	% of hub–spoke networks formally integrated into national NCD service delivery frameworks	Policy documents
Core	Output	Data & Research	Enhance data-driven care	% of sites using standardized electronic records	Digital registry report
Advanced	Outcome	Data & Research	Record completeness & accuracy	% of patient records with complete and accurate data fields	Digital registry report
Core	Output	Data & Research	Knowledge generation and sharing	# of international events attended to present GASP results	Project Records
Core	Output	Ecosystem Strengthening	Institutionalize CRD care within NCD frameworks	# of institutional collaboration agreements generated	Project Records
Core	Outcome	Ecosystem Strengthening	Institutionalize CRD care within NCD frameworks	# of policy documents produced/updated	Policy review
Core	Impact	Ecosystem Strengthening	Institutionalize CRD care within NCD frameworks	# of national or regional policies including CRD care	Policy review
Advanced	Impact	Ecosystem Strengthening	Ensure the sustainability of NCD interventions	% of program costs covered by domestic funding	National budget



Section 6
CONCLUSIONS

Chronic respiratory diseases (CRDs) represent a significant and growing global health challenge, particularly in low- and middle-income countries where **structural barriers continue to limit access to prevention, diagnosis, and long-term management.** The complexity of CRDs requires comprehensive and coordinated responses that go beyond disease-specific interventions and addresses the interaction of environmental, behavioral, and socio-economic determinants.

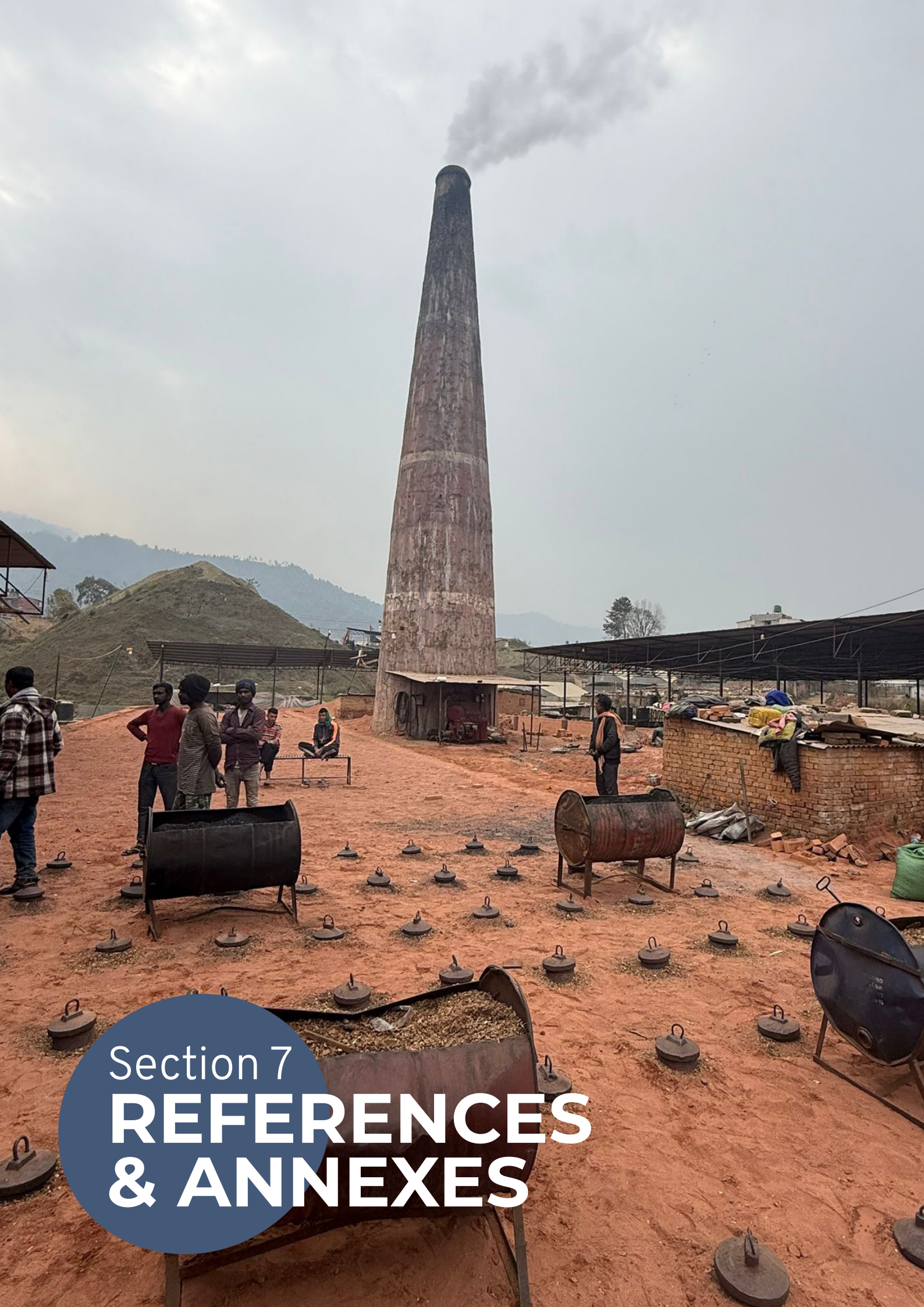
The GASP Model has been developed to respond to these challenges through an integrated and system-oriented approach that combines capacity building, digital health solutions, standardized clinical pathways, and alignment with international guidelines. By strengthening primary care systems and improving continuity of care, **the Model aims to support earlier diagnosis, more consistent disease management, and a reduction in avoidable morbidity associated with CRDs**. In addition, it promotes public health and preventive strategies, including tobacco control and environmental interventions, which are essential to address upstream determinants of disease.

A key strength of the Model lies in its adaptability to diverse healthcare contexts. By leveraging existing infrastructures and aligning with national health priorities, **GASP is designed to be implemented progressively, taking into account local constraints, resource availability, and system readiness.** The integration of digital health tools, including electronic health records and data-driven decision support systems, has the potential to improve monitoring, evaluation, and long-term patient management, although implementation remains dependent on infrastructure, workforce capacity, and governance frameworks.

At the same time, it is important to recognize that the Model is not a comprehensive solution to all challenges related to CRDs. Its effectiveness depends on **broader health system factors, including financing mechanisms, policy support, and the availability of essential medicines and trained personnel.** Furthermore, variability across implementation contexts may influence outcomes and limit immediate scalability.

Looking forward, the implementation of the GASP Model will require sustained political commitment, multi-sectoral collaboration, and continued investment in health system strengthening. Future efforts should prioritize the **generation of real-world evidence to better understand the model's impact,** feasibility, and cost-effectiveness across different settings.

In conclusion, addressing CRDs requires a shift from fragmented and reactive care models to more integrated and proactive approaches. The GASP Model represents a structured attempt to contribute to this transition, offering a flexible framework that can support improvements in respiratory care while remaining responsive to the constraints and evolving needs of the contexts in which it is implemented.



Section 7

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7.2. Annexes

Appendix 1 – Optional / Advanced Diagnostic Capabilities

This appendix describes advanced diagnostic tools that the GASP Model **may consider for more advanced or referral-level facilities**, to support the management of complex respiratory conditions beyond routine asthma and COPD care.

These tools **are not required for standard asthma or COPD management** and are not expected to be available in all settings. Their inclusion represents a **long-term, aspirational reference**, to be implemented based on feasibility, local/national priorities, and available resources.

The primary objective of the GASP Model remains the **delivery of essential care for asthma and COPD**. The tools below can support complex case assessment, differential diagnosis, and advanced monitoring.

Table – Optional / Advanced Diagnostic Tools

Test	Description	Level	Feasibility / Scope
FeNO	Non-invasive marker of airway inflammation; guides asthma diagnosis and steroid response.	Spoke / Hub	**High**
6-min walk	Simple functional test to monitor exercise tolerance and oxygen desaturation.	Spoke / Hub	**High**
Blood eosinophil count	Biomarker for type-2 inflammation; guides corticosteroid therapy.	Spoke / Hub	**High**
Thoracic Ultrasound	Bedside assessment of pleural effusion, consolidation, pneumothorax; portable and rapid.	Spoke / Hub	**High**
Oscillometry	Sensitive for small airway dysfunction; alternative to spirometry.	Spoke / Hub	**Medium / Aspirational**
Bronchoprovocation (Methacholine)	Confirms asthma when spirometry is normal; not routine.	Hub	**Medium / Aspirational**
Body plethysmography (TLC, FRC, RV)	Detailed lung volumes and air trapping; for complex cases.	Hub	**Low / Advanced Aspirational**
Gas transfer (DLCO)	Evaluates gas exchange; differentiates emphysema vs. chronic bronchitis; detects interstitial disease.	Hub	**Low / Advanced Aspirational**

Notes

Implementation depends on **training, infrastructure, and local priorities**.

GREEN indicates tools readily implementable, **YELLOW** is medium/aspirational, and **RED** is advanced/long-term.

For standard asthma and COPD care, focus remains on **core diagnostic tools** described in the main text.

The Paolo Chiesi Foundation is a philanthropic organization founded by Paolo Chiesi and his family, inspired by the belief that every person has the right to access quality healthcare and live a healthy life.

Its goal is to reduce neonatal mortality in sub-Saharan Africa and improve the health of patients with chronic respiratory diseases in the Global South.

The Foundation supports international scientific research and local development programs to transfer medical and scientific knowledge and support families in the healthcare process, promoting sustainable growth and empowering local communities.

Founded in Parma (Italy) in 2005 and operational since 2010, the Paolo Chiesi Foundation today operates in Benin, Burkina Faso, Burundi, Côte d'Ivoire, Guyana, Nepal, Peru, Senegal, Togo, and Uganda.

Vision

We imagine a world where patients with chronic respiratory diseases and all newborns, along with their mothers and families, regardless of where they live, have equal access to high-quality care and the right to live healthier lives.

Mission

We support local health programs by providing training, knowledge, and equipment and promoting infrastructure rehabilitation to reduce neonatal mortality rates in sub-Saharan African countries and improve the health and quality of life of patients with chronic respiratory diseases in the Global South.

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