STEPWISE FRAMEWORK FOR ACTION

17. GARD Approach

KEY MESSAGES

- **GARD will work at international and national level.**
- **GARD's planning steps correspond to WHO's strategic objectives and action plans.**
- **GARD will exploit synergies, building on and complementing existing programmes and projects.**

The Global Alliance against Chronic Respiratory Diseases (GARD) is a voluntary alliance of national and international organizations, institutions and agencies working towards the common goal of improving global lung health. The Alliance is part of WHO's global work to prevent and control chronic diseases, based on the stepwise framework (Figure 21) set out in *Preventing chronic diseases: a vital investment* (*1*).

Figure 21 Stepwise framework

Policy implementation steps	Population–wide interventions		Interventions for individuals
	National level	Sub-national level	
Implementation step 1 **Core**	Interventions that are feasible to implement with existing resources in the short term		
Implementation step 2 **Expanded**	Interventions that are feasible to implement with a realistic projected increase in or reallocation of resources in the medium term		
Implementation step 3 **Desirable**	Evidence-based interventions beyond the reach of existing resources		

Source: reference *1*.

Planning step 1: estimate population need and advocate for action

The basis for action is to estimate disease burden and population needs, identify risk factors for chronic respiratory diseases and respiratory allergies, and undertake surveillance on chronic respiratory disease risk factors, and trends in disease burden, as well as in costs, quality and affordability of care. The data will need to be compared between countries (high–income, and low- and middle-income) to define strategies for policy-makers and to assess the impact of chronic respiratory diseases programmes. There is also a need to advocate for action to combat chronic respiratory diseases in order to raise awareness among all stakeholders and make chronic respiratory diseases a public health priority in all countries.

With this in mind, GARD will assess needs and objectives, and propose a plan of action for future GARD activities.

Planning step 2: formulate and adopt policy

In all countries, a national policy and planning framework is essential to allocate chronic diseases appropriate priority and to ensure that resources are organized efficiently (*11*). GARD will provide the basis for action in the field of chronic respiratory diseases, with plans for the implementation of policies. Implementation will start with pilot studies, developed by local experts and stakeholders in each country, relevant to the needs, resources and setting of that country.

Comprehensive and integrated policies and plans for prevention are vital because they minimize overlap and fragmentation in the health system. Policies and plans to prevent chronic respiratory diseases should therefore (*1, 11*):

- Cut across specific diseases and focus on common risk factors' since many risk factors, such as tobacco smoking and other air pollutants, affect many different diseases.
- Encompass promotion, prevention and control strategies.
- Emphasize a population-based approach, rather than targeting specific subgroups.
- Integrate activities across settings, such as health-care centres, schools, workplaces and communities.
- Link with other government programmes and community-based actions.

Risk factors induce different diseases (Table 18), and some risk factors should only be targeted in some areas.

Many low-income countries may find it difficult to draw up control strategies for specific chronic diseases. They may opt to use integrated programmes already developed by WHO, covering communicable and chronic respiratory diseases for example, the Practical Approach to Lung Health (PAL) (*374–376*)

Table 18 Diseases resulting from exposure to risk factors

	Chronic respiratory diseases	Cardiovascular diseases	Respiratory cancer	Others major diseases
Active and second-hand smoking	+	+	+	Other cancers, diabetes
Solid fuels, indoors	+		+	Acute respiratory infections
Other indoor air pollutants	+	+	+	
Outdoor air pollutants	+	+	+	
Allergens	+			Allergic diseases
Inhaled occupational agents	+		+	
Diet and nutrition	±	+	+	Diabetes
Post-infection	+			

and the Practical Approach to Lung Health in South Africa (PALSA Plus) (*22*). In middle-income countries, however, some disease-specific plans already exist, for example the asthma plan in China, and the asthma and rhinitis plan in Brazil (Table 19). GARD therefore proposes a strategy which combines a syndromic approach (PAL and PALSA Plus) with a disease-specific approach (focusing on asthma and rhinitis, COPD, occupational chronic respiratory disease, and pulmonary hypertension). Since many countries will not have sufficient resources currently available to implement the entire policy, countries will need to decide on the best plan according to their priorities, resources, health systems and intersectoral possibilities.

Table 19 Some examples of countries with a national plan on chronic respiratory diseases

Country	Plan	Comments
Brazil	Asthma and rhinitis	in primary health care
China	Asthma, COPD	surveillance and awareness
Finland	Asthma, COPD	broad long term intervention
France	Asthma, COPD	
Portugal	Asthma, COPD	
USA	Asthma	

In the future, a syndromic approach will be developed for middle- and high-income countries (GARD implementation steps 2 and 3).

A policy or plan on chronic respiratory diseases should:

- **Promote health through the prevention of chronic respiratory diseases and respiratory allergies:** by reducing the burden of tobacco smoke and other types of indoor and outdoor pollution, occupational hazards and other relevant risk factors.

- **Recommend simple and affordable diagnostic tools for the diagnosis of chronic respiratory diseases and respiratory allergies:** taking account of the different health needs, the services to be provided and the resources available, as well as the need for adequate training of health professionals in the use of the tools.

- **Control chronic respiratory diseases and allergies, and ensure drug accessibility:**

  - in areas with a high burden of communicable diseases and a functioning primary health care service, by promoting models such as PAL;

  - in areas with a high prevalence of HIV infection, by promoting models such as PALSA Plus;

  - by using different models of prevention and care for chronic respiratory diseases in middle- and high-income countries to target asthma, rhinitis, chronic obstructive pulmonary diseases and occupational lung diseases;

  - by ensuring a focus on the control of occupational chronic respiratory diseases, sleep apnea syndrome and pulmonary hypertension, which have been insufficiently considered worldwide.

The key aspects of GARD action plans at national level will be:

- to ensure the availability of drugs in each treatment setting for patients with chronic respiratory diseases;

- to assist in the training of health-care workers in the management of chronic respiratory diseases to ensure that they are able to identify feasible options and then set priorities on the basis of current evidence;

- Develop a specific action plan for paediatric chronic respiratory diseases and respiratory allergies: covering chronic respiratory diseases in childhood and adolescence.

Planning step 3: identify policy implementation steps

Health priorities, geographic variability in risk factors and chronic respiratory diseases, the diversity of national health-care service systems and variations in the availability and affordability of treatments, all require that any recommendations should be adapted locally to ensure their appropriateness to the community in which they will be applied. GARD action plans developed during the planning step 2 will be collated and rolled out to as many countries as possible. The policy implementation process will follow the stepwise framework (*1*), and the results will be measurable:

- **Implementation step 1 (core):** interventions that are feasible to implement with existing resources in the short term.

- **Implementation step 2 (expanded):** interventions that are possible to implement with a realistically projected increase in, or reallocation of, resources in the medium term.

- **Implementation step 3 (desirable):** evidence-based interventions that are beyond the reach of existing resources.

The following chapters outline GARD's role in support of the three planning steps:

- estimate population need and advocate for action (Chapters 18 and 19);
- formulate and adopt policy (Chapters 20–23);
- identify policy implementation steps (Chapter 24).

18. Estimate Burden, Identify Risk Factors and Undertake Surveillance

KEY MESSAGES

- **In all countries, the prevalence and incidence of chronic respiratory diseases are under-investigated.**
- **Epidemiological studies, with questionnaires and simple spirometry, are needed to properly estimate the burden of chronic respiratory diseases.**
- **Existing WHO databases should be integrated with the data on chronic respiratory disease morbidity rates and any other risk factor data.**

Basic epidemiological data on the chronic respiratory disease risk factors, burden and surveillance are reported for less than 25% of the world's population and are largely from high-income countries. However, it is the low- and middle-income countries which will experience the largest increase in chronic diseases (*372*). Data on chronic respiratory disease risk factors, burden and surveillance are fragmented and often incomplete in high-income countries. Prevalence and morbidity data can underestimate the burden of chronic respiratory diseases because these diseases are not usually diagnosed until they are clinically apparent and moderately advanced.

These failures make it difficult to raise awareness and to elaborate policies for the prevention, diagnosis and control of chronic respiratory diseases, and to predict future diseases in the population. Standard disease definitions and methods to monitor the burden and provide surveillance over time need to be improved.

What will GARD do?

GARD will develop a standardized process to obtain data on chronic respiratory disease risk factors, trends in disease burden, and quality and affordability of care, as well as the economic burden. These data can then be compared between countries (high- middle– and low-income) in order to identify strategies for policy-makers and to assess the impact of chronic respiratory disease programmes.

Based on both WHO and non-WHO activities (Box 4), GARD will create an inventory of studies that have collected data on:

- The prevalence and severity of diseases, as well as their risk factors.
- The social and economic burden of chronic respiratory diseases.

GARD will also:

- Support countries in obtaining baseline measures and in monitoring trends in the burden of chronic respiratory diseases.
- Expand WHO internal initiatives in countries (such as the stepwise approach to surveillance (WHO-STEPS) and the Global InfoBase programmes).

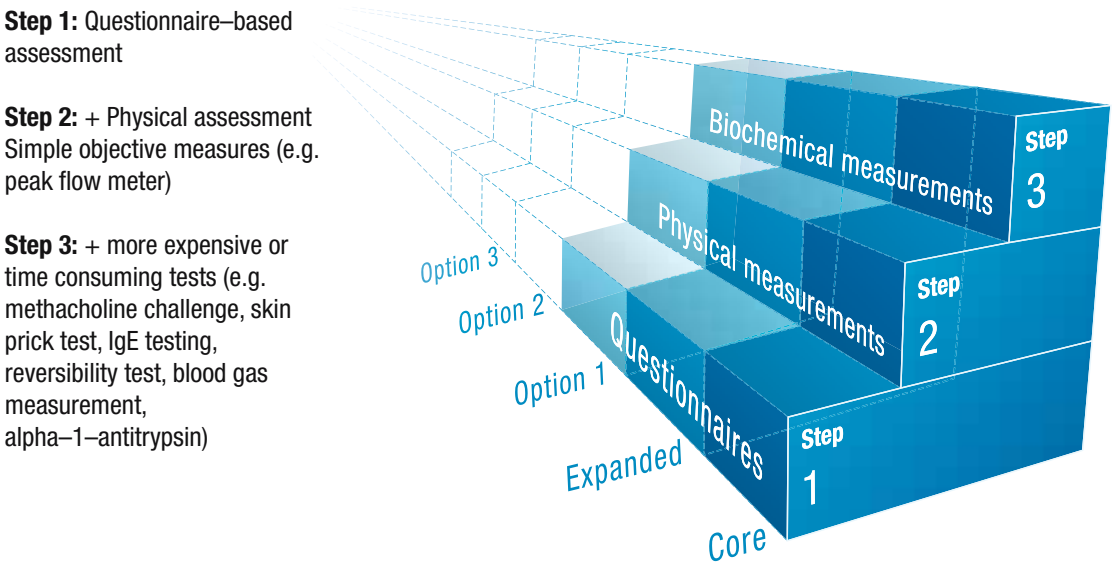
With regard to the stepwise approach to surveillance of chronic respiratory diseases, GARD proposes the following activities (Figure 22):

Step 1. Collect questionnaire-based information on tobacco use and any other indoor and outdoor pollution and respiratory symptoms. For asthma, the International Study of Asthma and Allergy in Childhood (ISAAC) and the European Community Respiratory Health Survey (ECRHS) questionnaires are available (*378, 379*). For COPD, several questionnaires, including the Burden of Chronic Obstructive Lung Disease (BOLD) questionnaire, are available (*164, 380, 381*).

Step 2. Use standardized physical examination and spirometry. Ideally, low-cost spirometry should be available in primary health care centres.

Step 3. Expand testing to full lung-function tests, oxymetry and allergy tests.

Figure 22 GARD proposal for the stepwise approach to surveillance of chronic respiratory diseases



Box 4 Surveillance: sources of information

Estimates of burden and mortality attributable to chronic respiratory diseases are needed to support advocacy. Information on which to base such estimates is available from a variety of sources, as listed below.

WHO sources

The WHO stepwise approach to surveillance (WHO-STEPS) **is a standardized tool to help low- and middle-income countries assess the risk factors of chronic diseases, (www.who.int/ncd_surveillance/infobase). WHO-STEPS focuses on building capacity in low- and middle-income countries in order to collect small amounts of high-quality data on risk factors.**

WHO surveillance of risk factors (SuRF) **displays data on prevalence and mean values of eight major risk factors related to chronic diseases, for WHO Member States (www.who.int/ncd_surveillance/infobase). SuRF responds to the fundamental need of public health systems to invest in surveillance.**

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BOX 4 (CONTINUED)

WHO questionnaire for national surveys of chronic respiratory disease capacity is a standardized and validated questionnaire that can be used to assess the national capacity for surveillance, prevention, and control of chronic respiratory diseases (*383*). It covers:

- Health indicators.
- Policies and operational plans.
- Legislation.
- Information systems and statistics.
- Structure and financing of prevention and treatment activities.
- Availability of national guidelines.
- Nature of available services.
- Human resources.
- Role of nongovernmental organizations.
- Capacity for monitoring and evaluation.
- Drug availability.

WHO study on prevalence of major respiratory diseases at primary health care level in low- and middle-income countries is investigating:

- Prevalence and severity of respiratory diseases.
- Under-diagnosis and management of respiratory diseases.

A two-stage survey is envisaged. The first stage will be a survey of individuals, aged 6 years or over, attending a primary health care clinic. It consists of a brief questionnaire administered by a doctor or nurse or technician to obtain information on demographics, exposure to risk factors (primarily smoking, occupational and domestic exposure to particulates from using solid fuels, and migration), respiratory symptoms, diagnoses and comorbidities. At the same time, similar data will be collected from outpatients attending emergency room departments. The second stage will be a clinical survey of respiratory patients of the same age within the same setting attending primary health care clinics. A general practitioner will examine the patient and fill in a questionnaire about the diagnosis. After that, a measurement of lung function will be performed by a technician or nurse to estimate the "true" prevalence of airway obstruction at the primary health care level. Some of the patients will be selected by WHO experts to be later evaluated by a research team in order to validate the general practitioner's diagnosis. The respiratory patients will also complete the questionnaire used in the first stage. The respiratory diseases covered include asthma, COPD, tuberculosis, pneumonia and allergic rhinitis.

Other sources

Various international and national surveys have been conducted and published in recent years, providing the basis for current estimates of burden and mortality attributable to chronic respiratory diseases. The information they present, however, is represents only high- and middle-income countries. Such sources include:

- Burden of Chronic Obstructive Lung Disease (BOLD) (www.kpchr.org/public/studies/stds) (*164*).
- United States Department of Health and Human Services: ***Healthy people 2010 goals for respiratory diseases*** (http://hin.nhlbi.nih.gov/as_frameset.htm).

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BOX 4 (CONTINUED)

- **European Community Respiratory Health Survey (ECRHS) (www.ecrhs.org) (*378*).**
- **European Respiratory Society (ERS): *White book* (www.ersnet.org) (*125*).**
- **Global Initiative for Asthma (GINA): report on the burden of asthma (*15*).**
- **Indicators for monitoring COPD and asthma in the EU (IMCA) (europa.eu.int/comm/health/ph_projects/2001/monitoring).**
- **International Study of Asthma and Allergy in Childhood (ISAAC) (http://isaac.auckland.ac.nz) (*384*).**
- **United States National Heart, Lung, and Blood Institute (NHLBI): *Fact book 2003* (http://www.nhlbi.nih.gov/about/factpdf.htm) and *Chart book 2003* (http://www.nhlbi.nih.gov/resources/docs/cht-book.htm).**

Deliverables to be produced by GARD

To assist in estimating the burden of chronic respiratory diseases, identifying risk factors and carrying out surveillance, GARD will undertake the following activities:

- Comparison and evaluation of the strengths and weaknesses of existing programmes assessing the chronic respiratory disease burden and risk factors, with a focus on low- and middle-income countries.
- Elaboration and publication of two chronic respiratory disease modules to be incorporated in WHO-STEPS and the WHO Global InfoBase.
- Publication of an expanded and upgraded version of the existing WHO questionnaire used to assess and monitor the national chronic respiratory disease capacity.

19. Advocate for Action

KEY MESSAGES

- **Although the cost of inaction is clear and unacceptable, preventable chronic respiratory diseases and their risk factors receive insufficient attention from the health-care community, government officials, the media, patients and their families.**
- **Chronic respiratory diseases need to be higher up the health agenda of key policy-makers.**
- **All stakeholders should be involved in increasing awareness of chronic respiratory diseases.**
- **An important part of advocacy is to disseminate information, the ultimate goal of which is to provide evidence that the burden of chronic respiratory diseases can be reduced.**

Having set out a framework for the prevention and control of chronic respiratory diseases, it is essential to seek early commitment from potential partners. Advocacy helps to set the record straight and to spur action at all levels.

- Hundreds of millions of people are affected by preventable chronic respiratory diseases. Currently 300 million people have asthma, 210 million people have moderate to severe chronic obstructive pulmonary disease, while millions of others suffer from mild chronic obstructive pulmonary disease, allergic rhinitis and other often-undiagnosed chronic respiratory diseases (*30-32*).

- Preventable chronic respiratory diseases have major adverse effects on the quality of life and ability of affected individuals. They cause premature deaths and jeopardize the economic prospects of families, communities and societies in general.

- The huge burden attributable to chronic respiratory diseases is largely unknown because these diseases are not accorded priority on the public health agenda of any country.

- Lack of awareness results in lack of attention being paid to chronic respiratory diseases, in particular as regards prevention, early diagnosis and control. In most low- and middle-income countries, lack of financial support is a barrier to capacity development for prevention, treatment and research.

- Chronic respiratory diseases need to be higher up on the health agenda of key policy-makers. Advocacy is needed to provide policy-makers with convincing evidence about the possibility of controlling risk factors, and persuading them to set in motion health system changes necessary to do so.

What will GARD do?

In order to address effectively the global public health problems caused by chronic respiratory diseases, GARD will endeavour:

- To make chronic respiratory diseases a public health priority in all countries.

- To ensure that governments, the media, the public, patients and health-care professionals (including those in schools and workplaces) are aware of the magnitude of this problem and that, where needed, appropriate information on known effective interventions is disseminated.

GARD will therefore be dealing with both awareness and dissemination. The goal of awareness is to draw attention to the problem of chronic respiratory diseases, while that of dissemination is to provide information about what can specifically be done, or what is recommended.

Awareness

Despite growing evidence of epidemiological and economic impact, the global response to the problem of chronic diseases remains inadequate (*385*). The most important barrier to changing this unsatisfactory situation is the refusal to recognize the problem. There are 193 countries with different needs, priorities, economic status, health-care systems and it is impossible to convey a single message. A message about spirometry is not relevant to all of these countries because most cannot provide access to it for their populations.

In raising awareness, GARD will invite a broad range of stakeholders to contribute, including:

- **Governments.** The governments of countries where an action plan has been initiated have a critical role to play.

  - governments are concerned with the well-being of their citizens, and need to address the socioeconomic consequences of poor health status of the population. If governments show interest in health issues, then the media and the public will also be interested;

  - it is important that a high-level government official, such as the Minister of Health, acts as the spokesperson for the issue.

- **Physicians and other health-care professionals.** The medical community is an important target of an awareness campaign. While physicians know about chronic respiratory diseases, they are usually unaware of the effectiveness of prevention and management methods. Thus there is a need to disseminate information on appropriate and effective interventions for prevention and treatment.

- **Patients and the public at large.** GARD can reach patients and the general public through the media and the Internet. Newsworthy stories can be used to draw attention to chronic respiratory diseases. People are more aware of asthma because many famous athletes have competed on the world stage despite having asthma. COPD has not benefited in the same way,

partly because of the stigma attached to patients because their diseases are regarded as their own fault.

- **The media.** The media represent a very potent vehicle in increasing public awareness, but the interest of the media is unlikely to be mobilized unless governments focus on the problem. With greater public awareness, patients and their families will in turn become more proactive about the conditions which affect them.

- **Private sector.** The pharmaceutical industry and manufacturers of diagnostic tools could be mobilized to play a role in raising awareness, subject to the strict rules applicable to private sector interaction with GARD (*27*).

- **Academic research groups.** One of the challenges of GARD will be to evaluate cost-effectiveness of various strategies for prevention and control of chronic respiratory diseases. This task can only be accomplished with the collaboration of academic research groups.

- **Nongovernmental organizations and foundations.** Nongovernmental organizations and foundations may provide invaluable brain power and financial resources.

- **United Nations agencies.** Aiming at health promotion and disease prevention, United Nations agencies could be of great help.

Box 5 The World Health Organization

WHO has the experience to implement awareness campaigns through local/country/regional governments and the commitment of WHO to support GARD is essential in ensuring its success. There are success stories and they must be communicated (albeit carefully) to officials of governments where GARD is implemented. One of these, Health and Environment Linkage Initiatives (HELI, www.who.int/heli/en/) is a global effort by WHO and UNEP (United Nations Environment Programme) to support action by low and middle income country policymakers on environmental threats to health. HELI encourages countries to address health and environment linkages as being integral to its economic development.

The World Health Assembly will not address GARD in the current year, but could do so in future years. The *WHO Bulletin* is also an effective tool.

An approach to reach all the target audiences is to add information about GARD to the ongoing relevant World Day Campaigns – World Asthma Day, World Allergy Day, and World COPD Day. All of these World Day Campaigns have been active for a number of years, and have reached a wide target audience in many countries. Each year, they have a theme, with activities conducted in a variety of settings. The public responds, as they have an interest in a specific disease, or a member of their family has that disease.

GARD could provide information (flyers, posters, documents) to be added to the materials for these ongoing World Day Campaigns. In preparing publicity materials, GARD should examine how awareness campaigns about other

chronic diseases have been conducted (for example, hypertension, kidney diseases and diabetes). Perhaps, in due course, it might be appropriate to consider a specific GARD World Day.

Dissemination

GARD will also be involved with dissemination. Dissemination differs from awareness with regard to both target audience and content. The ultimate goal of dissemination of information about chronic respiratory diseases is to provide evidence that something can be done. Chronic respiratory diseases can be prevented using a variety of strategies and interventions. In addition, most patients with chronic respiratory diseases can be effectively treated. Governments, the public, and patients and their families need to receive these messages. In the absence of a positive message, no interest will develop and no changes will occur.

Health-care professionals are the main target of dissemination efforts concerning chronic respiratory diseases, albeit not the only one. Unfortunately, in many countries, medical education does not focus enough on chronic respiratory diseases and thus physicians and other health-care professionals may not be fully aware of what can be done. The Practical Approach to Lung Health (PAL) is a model that has worked. GARD should consider developing a global or regional educational programme about chronic respiratory diseases aimed at the medical profession. To do so, GARD should consider building partnerships with local or international professional societies.

20. Implement Prevention and Health Promotion

KEY MESSAGES

- **Everyone has the right to live and work in an environment where the air is clean.**
- **Environmental exposure to an unhealthy environment can cause severe and debilitating COPD, asthma, cardiovascular disease and cancer.**
- **Complete elimination of the risk factor is the only way to remove the risk, be it cigarette smoke, indoor or outdoor air pollution, allergens or occupational exposure.**

Health promotion is the process of enabling people to increase control over their health and its determinants. It is a core function of public health and a cornerstone of primary health care (*386*). The cost–effectiveness of any health-promotion programme should be carefully evaluated before the programme is implemented.

Health promotion and prevention programmes should focus on the major risk factors for chronic respiratory diseases. Smoking, solid fuel and occupational exposure are the most important ones, but other risk factors such as allergen exposure and outdoor pollution should also be considered. Long-term effects from the abatement of tobacco smoke, environmental exposure to tobacco smoke and outdoor air pollution are raising great expectations (*387*). Population-based strategies that seek to shift the distribution of risk factors often have the potential to produce substantial reductions in disease burden (*388*).

There are three levels of prevention (*389*):

- **Primary prevention** is the protection of health by personal and community-wide actions, e.g. preserving good nutritional status, physical activity and emotional well-being, immunizing against infectious diseases and making the environment safe.
- **Secondary prevention** encompasses the measures available to individuals and populations for early detection of departures from good health, and prompt and effective intervention to correct them.
- **Tertiary prevention** consists of the measures available to reduce or eliminate long-term impairments and disabilities, to minimize suffering caused by existing departures from good health, and to promote the patient's adjustment to irremediable conditions. This extends the concept of prevention to the field of rehabilitation (*390*). This chapter highlights some key points of disease prevention.

The chronic respiratory disease epidemic is in large part linked to risk factors. Many risk factors predisposing people to chronic respiratory diseases are preventable, but policy and legislation are still inadequate throughout the world, particularly in low– and middle–income countries. The Framework Convention on Tobacco Control (FCTC) is an international treaty that has been

ratified by over 140 countries, but it has yet to been ratified by many other countries. Indoor pollution is a major cause of chronic respiratory diseases, especially in low– and middle–income countries. Many people, however, are still unaware of the damage to respiratory health caused by indoor pollutants. In many countries, harmful occupational exposure is a major cause of chronic respiratory diseases but workers are not protected adequately. Screening programmes and prevention in schools are the exception rather than the rule.

Countries should implement policies to reduce the burden of tobacco smoke, indoor and outdoor pollution, occupational hazards and other risk factors of relevance for chronic respiratory diseases. In support of such action, and in response to requests from countries, GARD will:

- Provide guidance on establishing programmes to prevent chronic respiratory diseases.
- Help countries to formulate national objectives and realistic timetables for their achievement.
- Develop a measurable process and output indicators for accurate monitoring and evaluation of actions.

In providing support to countries, GARD will seek synergies with existing activities (Box 6) in order to maximize the effect of its work.

What will GARD do?

GARD will work towards reducing exposure to the major risk factors for chronic respiratory diseases. To do so, GARD will promote – and support countries in implementing – the following important policies.

Ban smoking

Several countries and hundreds of local jurisdictions in the world have successfully implemented laws requiring indoor workplaces and public places to be 100% smoke-free without encountering significant challenges in enforcement. The evidence from these jurisdictions consistently demonstrates not only that smoke-free environments are enforceable, but that they are popular and become more so following implementation. These laws have no negative impact and often have a positive one, on businesses in the hospitality sector and elsewhere. Their outcomes, a likely reduction in heart attacks and respiratory problems, also have a positive impact on health. Developed and developing countries like Ireland, New Zealand, Scotland and Uruguay, have built on the implementation of smoke-free laws at the local level that began in North America in the late 1970s. With almost universal success, they have since enacted and implemented laws to protect workers and the public from second-hand smoke in almost all indoor workplaces and public places (including bars and casinos), achieving strong popular support. Other countries are interested in learning from their experiences.

Smoke-free workplaces result in lower levels of tobacco consumption among smokers and are associated with a greater likelihood of workers implementing smoke-free policies in their homes (*391-393*). Therefore,

smoke-free workplace legislation should be a primary strategy in protecting individuals from second-hand smoke in their home. According to WHO Policy recommendations on protection from exposure to second-hand tobacco smoke (*394*), removing the pollutant —tobacco smoke — through implementation of 100% smoke-free environments is the only effective strategy to reduce exposure to tobacco smoke in indoor environments to safe levels and to provide an acceptable level of protection from the dangers of second-hand smoke exposure. Therefore, legislation that includes ventilation and smoking areas, whether separately ventilated from non-smoking areas or not, is not recommended.

GARD will promote legislation to ensure that:

- All workers can work in a smoke-free environment.
- Citizens can enjoy smoke-free public places.
- People who buy or rent a new house have smoke-free cooking options.

In order to prepare for a ban on smoking, GARD will:

- Encourage active role of legislators.
- Conduct campaigns to educate the general public, and patients and their families on the benefits of a smoke free indoor environment.
- Identify natural allies in the mainstream, such as trade unions and employers associations.
- Identify a number of independent ”champions”, including selected politicians.
- Track public opinion continuously and regularly publicize support.

The objective is to create (over a 3–year period) a favourable climate for legislation.

In terms of implementation, GARD will:

- Build enforcement mechanisms to ensure compliance when imposing a ban on smoking.
- Prevent introducing the smoking ban overnight, and support it only when enforcement mechanisms are ready.
- Establish confidential channels for complaints about violations of the smoking ban, so that inspections can focus on suspected cases of non-compliance.
- Make bar owners liable to fines and loss of license if they fail to implement the smoking ban.

- Conduct inspections in the months following the introduction of the smoking ban (in Ireland, 35 000 inspections were carried out in the first 9 months after the smoking ban was introduced, for an Irish population of 4 million).

- Publish success stories to create a landslide effect.

The indicator to be used to evaluate GARD's activity will be the number of countries that have benefited from GARD's support where a smoking ban has been approved and implemented according to the above terms.

Box 6 Prevention and promotion: potential synergies

WHO programmes on Health Promotion and Prevention

Numerous initiatives have contributed to health promotion and prevention of chronic respiratory diseases. Some are directly related to WHO, or are WHO activities, others are not. GARD should be able to help countries to formulate and adopt integrated policies in the field of chronic respiratory diseases.

WHO activities

- **WHO Framework Convention on Tobacco Control (WHO FCTC).** **This is the first international public health treaty, that reaffirms the right of all people to the highest standard of health. The WHO FCTC was initiated and negotiated under the auspices of the WHO (*393*)(www.who.int/tobacco). It was developed in response to the globalization of the tobacco epidemic (*392*). Since its entry into force on 27 February 2005, the Convention has attracted a high number of parties and has become one of the most widely embraced treaties in the history of the United Nations. Among its many measures, the treaty requires countries to impose restrictions on tobacco advertising, sponsorship and promotion; establish new packaging and labelling of tobacco products; establish clean indoor air controls; and strengthen legislation to clamp down on tobacco smuggling (e.g. increasing the tax and prices on tobacco products).**

- **Prevention of Allergy and Allergic Asthma.** **WHO has organized consultations and published publications in this field, addressing primary and secondary prevention (*396, 397, 398*).**

- **Programme on indoor air pollution** **(www.who.int/indoorair). WHO's programme on indoor air pollution focuses on:**

  - research and evaluation;
  - capacity building;
  - evidence for policy-makers.

- **Programme on Air Quality and Health** **(www.euro.who.int/air). The programme on Air Quality and Health programme of WHO based in Bonn, evaluates health risks of air pollutants producing WHO Air Quality Guidelines, supporting assessment of health risks of the pollution as well as development of tools helping in risk reduction.**

- **Programme on occupational chronic respiratory diseases.** **WHO addresses occupational health through a programme at WHO headquarters, in the six WHO regional offices and in WHO country offices, with the support of a network of 64 Collaborating Centres (www.who.int/occupational_health). WHO is implementing a global strategy to:**

  - provide evidence for policy, legislation and support to decision-makers, including work carried out to estimate the magnitude of the burden of occupational diseases and injuries;

BOX 6 (CONTINUED)

- provide infrastructure support and development through capacity building, information dissemination and networking;
- support protection and promotion of workers' health.

Other activities

- **European Environment and Health Committee.** **The European Environment and Health Committee is a coalition that brings together representatives from health ministries, environment ministries, intergovernmental organizations and civil-society organizations. Its overall role is to support countries as they try to reduce environmental hazards that affect human health. It oversees coordination and follow-up of the outcomes of the environment and health process in the European Region, and helps to promote and ensure reporting back on the implementation of the commitments made at the Fourth Ministerial Conference on Environment and Health which took place in Budapest in June 2004. The WHO Regional Office for Europe is a member of European Environment and Health Committee (www.euro.who.int).**
- **Children's Environment and Health Action Plan for Europe.** **The Children's Environment and Health Action Plan for Europe was launched in 1989 with the aim of eliminating the most significant environmental threats to health as rapidly as possible. It takes the approach that prevention is better than cure. Progress is marked by a ministerial conferences, held every five years. Environmental health issues are essentially cross-sectoral, and the conferences bring together different stakeholders to take decisions, working with and across ministries, and involving intergovernmental and international organizations and civil society organizations.**

Reduce indoor air pollution

In low- and middle-income countries, preventive measures include improved cooking devices and practices, alternative fuels, placing kitchen separate from the house, avoiding smoke and reducing need for fire, as well as better ventilation of dwellings.

Improved stoves and stove maintenance reduce indoor air pollution and exposure (*399*). In Xuanwei, China, the incidence of COPD decreased markedly after household coal stoves were improved (*400*). Programmes aiming to improve stoves need to obtain wider acceptance and uptake of culturally acceptable and feasible alternatives to the high-exposure cooking stoves currently being used by most people worldwide.

Linkages between household energy technology, indoor air pollution and greenhouse gas emissions have become increasingly important in understanding the local and global environmental and health effects of domestic energy use. Transition from biomass fuels to gas and kerosene would delay several million deaths (*303*). Reducing the use of solid fuels is also economically important and should improve ecosystem stability, since the inefficient use of fuel wood is considered one of the important causes of deforestation (*401*). The social, cultural, economic, technological and environmental implications of each intervention strategy, beyond its impact on exposure reduction, should be monitored (www.who.int/indoorair) and anticipated (*402*). The division of labor, gender relations, and the decision-making process in the household all need to be considered (*401*). Experience gained from projects to introduce improved stoves highlights the importance of involving women in decision making that directly involves their lives (*403*). Home ventilation needs to be improved. In a study in Guatemala, the prevalence of all the symptoms of asthma and severe asthma were higher

in children from households that used open fires compared to those using improved stoves with chimneys (*404*).

Strategies to reduce the negative health and environmental effects of solid fuels (www.who.int/heli/risks) include:

- Shifting from solid fuels to cleaner energy technologies, and pricing smokeless fuel competitively to encourage substitution.
- Improving the design of stoves and ventilation systems.
- Raising public awareness of the health risks of indoor air pollution.

In high-income countries, the right to breathe healthy air in dwellings was recognized as a fundamental right by WHO in 2000. The Towards Healthy Air in Dwellings in Europe (THADE) project has been promoted by the European Federation of Asthma and Airways Diseases Patients' Associations (EFA) with the support of the European Commission. The aims of the THADE project are to:

- Produce maps of pollutants in European dwellings.
- Review the data related to exposure to air pollution in dwellings, and to their health effects, particularly as regards allergies, asthma and other chronic respiratory diseases.
- Review cost-effective measures and technology to improve air quality in dwellings.
- Review legislation and guidelines on air pollution and air quality in dwellings.
- Recommend an integrated strategy that defines appropriate indoor air quality policies for implementation in Europe.

The following actions will help to prevent the adverse effects of poor air quality in dwellings:

- Improve ventilation.
- Improve cleaning methods and housing hygiene.
- Avoid wall-to-wall carpeting.
- Control moisture to prevent the accumulation of mould.
- Control the sources of pollution, e.g. tobacco smoke, and emissions from buildings and consumer products.

Avoid allergens

In theory, allergies could possibly be prevented at three levels (*50, 393*). *Primary prevention* takes place before there is any evidence of allergy, in

subjects exposed to known risk factors. Because allergy sensitization can occur early in life (*405, 406*), much of the focus of primary prevention will be on perinatal interventions. To date, however, there is no proven effective measure for primary prevention. Research is ongoing, and it is hoped that effective primary prevention strategies will be found. *Secondary prevention* is employed after risk factors have induced an effect, but before there is any clinical evidence of allergy (e.g. primary sensitization to allergens without asthma or rhinitis without asthma). Secondary preventive measures have been tested, but draw doubtful conclusions. *Tertiary prevention* involves the avoidance of risk factors when an allergy is established. Tertiary prevention should be introduced early to prevent long-term consequences of the allergy, which may be intractable even with total avoidance of the risk factor. Although complete avoidance of allergens in high altitude was found to improve allergic asthma, most avoidance measures for mites, animal danders and cockroaches are ineffective (*407*). In inner cities, home-based environmental interventions were found to improve asthma (*408*). More data are needed to establish general strategies for tertiary prevention of allergic asthma.

Prevent occupational chronic respiratory diseases

Occupational chronic respiratory diseases represent, in high–income countries, as well as in low- and middle-income countries, a public health problem with substantial economic implications. Preventing such diseases is therefore extremely important. Given its global mandate, WHO has launched the WHO Global Occupational Health Programme (http://www.who.int/oeh/index.html). Several initiatives have also been launched at governmental level for the prevention of occupational asthma, for example in France (http://www.sante.gouv.fr) on 28 January 2002 and in the United Kingdom (http://www.hse.gov.uk/condocs) on 10 October 2001. Labour unions are deeply involved in the management and prevention of occupational asthma. The three levels of prevention, mentioned before, apply.

Exposure limits are the basis of primary prevention. In the case of occupational asthma, the single most significant determinant is the level of exposure (*340*). For crystalline silica dust, the threshold limit values – time weighted average (TLV-TWA) levels of exposure should not exceed 0.05 to 0.1 mg/m^3 (*409*). A TLV-TWA of 0.5 mg/m^3 has been suggested for flour dust. Maximum exposure to isocyanates should not exceed 5 part per billion at any time.

Exposure to silica dust and agents causing occupational asthma should be reduced by adequate environmental controls and respiratory protection at work. Positive pressure masks have been developed that allow for the complete avoidance of harmful inhalants.

For asbestos exposure, the recommendations are less straightforward. Asbestos has been banned in many countries, principally because of the risk of mesothelioma, a cancer of the pleura. Clearly, spray-on procedures using asbestos fibres and applications of crocidolite asbestos should be banned. A programme should take into account the cost of substitutes to industrializing countries, in particular water-poor countries. For instance, an exception to the ban could be made for certain applications such as the manufacture of water pipes for their burgeoning cities.

If primary prevention is not feasible, then the emphasis has to be on the secondary and tertiary prevention of occupational chronic respiratory diseases. It is of great importance to diagnose the disease early and propose a management plan. Early recognition of occupational chronic respiratory diseases is an essential step in preventing the onset of severe persistent disease which could progress even after the occupational agent has been removed. If exposure continues, symptoms are likely to become increasingly severe (*410, 411*). Once chronic respiratory diseases are established, progression of the disease and asthma exacerbations may be triggered by other agents, such as tobacco smoke, cold air and exercise. If people are removed from exposure to the substance causing chronic respiratory diseases as soon as they start to develop symptoms, they are more likely to make a complete recovery than if the exposure continues. In the case of occupational asthma, early signs are rhinitis and non-specific bronchial hyper-responsiveness. When exposure continues, symptoms of chronic respiratory diseases become increasingly severe and may be permanent.

Comprehensive approach for occupational chronic respiratory diseases prevention

Smoking and tuberculosis are major co-factors in the development and severity of occupational chronic respiratory diseases, necessitating a comprehensive approach to address smoking and tuberculosis in occupational settings (*38, 334, 335*). Individuals with tuberculosis scars in their lungs and smokers who have sub-clinical COPD may be more susceptible than others to developing chronic respiratory diseases when exposed to additional respiratory risk factors.

GARD's efforts will be directed towards facilitating and supporting efforts by countries to draw up and implement an indoors tobacco smoking ban, an action plan to control indoor air pollution, a policy on allergy prevention, and a strategy to prevent occupational chronic respiratory diseases. The success of GARD's efforts will be measured in terms of:

- Increased number of countries with an indoors tobacco smoking ban facilitated by GARD.
- Increased number of countries with an action plan facilitated by GARD to prevent other forms of indoor air pollution.
- Increased number of countries with policies on allergy prevention facilitated by GARD.
- Increased number of countries with an occupational strategy facilitated by GARD.

21. Improve Diagnosis of Chronic Respiratory Diseases and Respiratory Allergies

KEY MESSAGES

- **In all countries, chronic respiratory diseases are underdiagnosed.**
- **There is a need for early diagnosis of chronic respiratory diseases in order to reduce the severity of disease and disability.**
- **Ideally, low-cost and effective spirometry should be accessible to all. However, at present, the use of spirometry for all patients at risk cannot be recommended as it would require resources that are not readily available in many low-income countries.**

To improve the diagnosis of chronic respiratory diseases and respiratory allergies, it is necessary to consider:

- Target population (whole population, groups at risk, individuals).
- Stages of disease (early disease, established disease, disability).
- Importance of risk factors inducing the disease (low risk or high risk).
- Level of affluence of the country.

This chapter focuses primarily on asthma and chronic obstructive pulmonary disease. GARD suggests the use of a symptom-driven approach to initially develop a "syndromic" definition of chronic respiratory disease.

Chronic respiratory diseases are under-diagnosed in all countries, but particularly in low- and middle-income countries. Many patients are not diagnosed until chronic respiratory diseases are severe enough to prevent normal daily activities, including attendance at school or work. Wheezing is often considered to be the expression of an acute infection. The diagnosis of chronic respiratory diseases is delayed, being made only after several exacerbations. There are a limited number of diagnostic tests for the early screening of predisposition to COPD, asthma or allergy. These tests are generally not used correctly to establish preventive measures in groups at risk. Training on the indications for diagnostic testing, and on the use and interpretation of diagnostic tests, is insufficient. Furthermore, in low- and middle-income countries, much medical equipment is not in use because of a lack of maintenance or spare parts, because it is too sophisticated, or simply because the health personnel do not know how to use it.

GARD will develop recommendations to countries on how to:

- Provide simple, available and affordable diagnostic tools for chronic respiratory diseases and respiratory allergies, using a stepwise approach adapted to different health needs, services and resources.
- Provide evidence-based training for health-care professionals on diagnosis of these conditions.

Box 7 Diagnosis: potential synergies

Diagnostic algorithms developed as part of the Practical Approach to Lung health (PAL).

Occupational health policies for diagnosis.

Strategy to assist national health authorities in the selection, procurement, use and disposal of high-quality medical devices that meet their particular needs (www.who.int/medical_devices/en/) as part of public health policy. A chronic respiratory diseases module will be developed by GARD.

Global Alliance on Healthcare Technology: an initiative of WHO and the World Bank to propose practical solutions to the major problems facing low- and middle-income countries regarding health technology.

Other recommendations for diagnosis:

American Academy of Allergy, Asthma and Immunology (AAAAI) and American College of Allergy, Asthma and Immunology (ACAAI): practice parameters on asthma and rhinitis (*412*).

Allergic Rhinitis and its Impact on Asthma (ARIA): diagnosis of allergy and rhinitis (*51*).

American Thoracic Society/European Respiratory Society (ATS/ERS): standards for the diagnosis and treatment of COPD (*106*). Recently a landmark for the implementation of pulmonary function tests has been achieved through the ATS/ERS standards, published as a series of articles in 2005 (*416–421*), setting a benchmark that will facilitate the manufacturing and use of homogeneous instruments, thereby reducing technical variability and promoting the widespread use of functional evaluations.

European Academy of Allergology and Clinical Immunology (EAACI): position paper on skin tests (*422*).

Global Initiative for Asthma (GINA): diagnosis of asthma (*50*).

Global Initiative for Chronic Obstructive Pulmonary Disease (GOLD): diagnosis of COPD (*107*).

International Primary Care Airways Group (IPAG): guidelines for the diagnosis of chronic respiratory diseases (www.theipcrg.org/guidelines/ipag_backgrounder.php).

International Primary Care Respiratory Group (IPCRG): guidelines for the diagnosis of chronic respiratory diseases (*423, 424*).

What will GARD do to improve the diagnosis of chronic respiratory diseases?

The aims of GARD's activities are to:

- Reduce the under-diagnosis of chronic respiratory diseases.
- Advocate for early diagnosis of chronic respiratory diseases.
- Ensure that all patients with chronic respiratory diseases have access to affordable diagnostic tests.
- Develop training programmes for health-care workers on diagnostic testing, covering indications for carrying out diagnostic tests, and the use and interpretation of results.

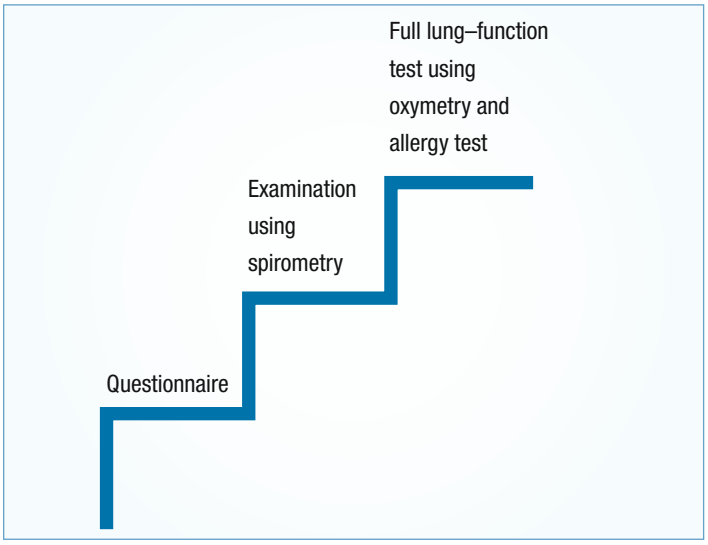
The diagnosis of chronic respiratory diseases is based on a stepwise investigation (Figure 23).

- The first diagnostic step is a simple questionnaire to assess clinical presentation. A questionnaire and an **examination of the patient** are, however, incomplete predictors of airflow limitation.

- The second diagnostic step is a **simple lung-function measurement** using spirometry. This will improve the sensitivity of the diagnosis evaluation and the assessment of severity of the disease. Accurate diagnosis is important because treatment for asthma and COPD differ. Additionally, recording a correct diagnosis will improve the validity of epidemiological studies (*425*).

- The third diagnostic step consists of other tests, including **full pulmonary function tests, oxymetry and allergy tests** (*426*). Such tests will be performed, when needed, to improve the diagnosis further, refine the assessment of severity, follow up patients, and give an insight into risk factors.

Figure 23 Diagnosis of chronic respiratory diseases based on a stepwise investigation



One of the major goals of GARD is to ensure that pulmonary function testing, under the second diagnostic step, is available and accessible to all patients. At present, however, the use of spirometry for all patients at risk cannot be recommended, as it would require the testing of a large number of individuals and would involve tremendous costs and taking up too much of health-workers' time.

Moreover, low-cost, efficient spirometers still need to be selected. The training of health-care workers also represents a large task. A working group of the Forum of International Respiratory Societies (FIRS) is currently investigating this problem, and GARD will use its recommendations.

It is unclear whether lung-function testing would induce behavioral changes, including smoking cessation (*427*).

Ensuring the availability and accessibility of simple allergy tests is another of GARD's goals for the second diagnostic step. The use of a validated and standard tool for diagnosis of atopy will make comparisons between populations more reliable. This is crucial for identification of risk factors and to test interventions.

GARD will produce the following deliverables:

- Manual on the diagnosis of chronic respiratory diseases, including a questionnaire and guidance on simple lung-function measurement.

- Manual on allergy diagnosis in low- and middle-income countries.

What will GARD do to improve the diagnosis of asthma and COPD at country level?

Asthma

- The Global Initiative for Asthma (GINA) (*50*) and the United States National Asthma Education and Prevention Programme (NAEPP) guidelines (*428*) advocate the measurement of symptoms and lung function to diagnose asthma, and medication requirements to assess severity. Although this approach is feasible and very accurate (*429*), it is, however, underused (*430, 431*). Furthermore, as it is only feasible in patients over 5 years old, the diagnosis of asthma in infants and young children is still a problem (*432*).

- Simple questionnaires can differentiate between asthma and COPD (*433–435*).

- When asthma is diagnosed and the treatment established, it is essential to monitor follow-up. A shift in the paradigm of follow-up has occurred within the past 5 years. Many guidelines now recommend assessing the control of asthma, and basing management on current therapies and quality of control (*436*). Control can be assessed by asking patients a few simple questions about night-time symptoms, daytime symptoms, activities of daily life, needs for rescue medication, and frequency of unscheduled visits to a doctor or hospital for an asthma exacerbation (*437*). Various instruments have been proposed and some have been validated, including the Royal College of Physicians' Asthma Control Test (*438*) or Asthma Control Questionnaire (*439*).

- Additionally, measures of lung function may be used to follow up patients (*440*). Monitoring peak expiratory flow (PEF) is an important and affordable clinical tool in the emergency department and hospital, and for a few patients is useful in the home (*441*).

At national level, GARD will promote the implementation of action plans that:

- Provide simple questionnaires for asthma screening.

- Educate health-care providers in the use of the questionnaires.
- Increase the availability and accessibility of pulmonary function tests for all patients.
- Improve the follow-up of patients, by means of control assessment.
- Develop simple and affordable allergy tests.
- Assure the availability and accessibility of inhaled corticosteroids and bronchodilators.

Chronic obstructive pulmonary disease

The classification of disease severity into four stages for the management of COPD is largely symptom-driven (106). This staging, as laid out by WHO (http://www.who.int/respiratory/en/), "is a pragmatic approach aimed at practical implementation and should only be regarded as an educational tool, and a very general indication of the approach to management". It implies that the leading principle for diagnosis is clinical presentation, rather than the presence of risk factors such as cigarette smoke and exposure to particles. Admittedly, the relationship between degree of airflow limitation and the presence of symptoms is imperfect.

The use of simple questionnaires has been advocated for use at primary care (*434, 442–445*) or referral level (*446*).

The GOLD guidelines (*107*) base the diagnosis of COPD on a history of exposure to risk factors and the "presence of airflow limitation that is not fully reversible, with or without the presence of symptoms". Lung-function tests should be performed for airflow limitation, even in the absence of dyspnea. COPD can be diagnosed on the basis of case history, and physical, and laboratory data, even if spirometry is not available *(107)*.

Spirometry is the gold standard for the diagnosis and assessment of COPD, as it is the most reproducible, standardized and objective way of measuring airflow limitation. Clearly, spirometry could be used in primary care, provided that adequate resources, training and quality control were available (*447*). However, in most primary health care centres in the world, spirometry is not available. The threshold $FEV_1/FVC < 70\%$ has been proposed to confirm the presence of an airflow limitation that is not fully reversible. It is questionable, however, whether this measurement should be advocated, since chronic severe asthma might present with an irreversible component, and the intensive use of combined bronchodilator drugs might induce reversibility in COPD patients.

The measurement of lung function should therefore be advocated for the diagnosis of COPD in symptomatic patients, complementing clinical information and identifying those with severe disease. There is insufficient evidence to recommend lung-function screening for populations at risk, and there is insufficient evidence to determine whether the early detection of COPD by lung function measurement alone would improve the prognosis.

22. Control Chronic Respiratory Diseases and Allergies by Increasing Drug Accessibility

KEY MESSAGES

- **An integrated approach to the prevention, diagnosis and management of chronic respiratory diseases, as proposed in the WHO Practical Approach to Lung Health (PAL) and the WHO Practical Approach to Lung Health in South Africa (PALSA Plus) is recommended by GARD as suitable for primary care in low- and middle-income countries.**
- **In high-income countries, disease-specific approaches may be more appropriate.**
- **Chronic respiratory diseases in childhood and adolescence need a specific attention.**
- **In all countries, the control of occupational chronic respiratory diseases is a priority.**
- **Access to and affordability of diagnostics and drugs are essential.**
- **GARD action plans should be tailored to each country's needs, priorities, health services and resources.**

In all countries:

- Chronic respiratory diseases are unrecognized and under-treated.
- Education of health-care providers needs to be improved.
- Integration of care for chronic respiratory diseases between primary and referral levels is essential for optimal management of these chronic diseases.

In low- and middle-income countries:

- Most patients with asthma or COPD receive treatment only during exacerbations, rather than benefiting from continuous care.
- Drugs are often unavailable or not affordable.
- In low-resource settings, putting evidence into practice requires context-specific and user-friendly formats, such as algorithms (*21*).

What will GARD do?

GARD will work to improve the control of chronic respiratory diseases and related allergies through:

- The development, validation and implementation of simple and affordable approaches.
- The training of health professionals appropriate for each country's needs, priorities, health-care systems and resources.

Action plans need to be tailored to low-, middle- and high-income countries or regions within countries (Figure 24). In areas with a high burden of

communicable diseases and functioning primary health-care centres, approaches such as the WHO Practical Approach to Lung Health (PAL) model will be promoted. In areas with a high prevalence of HIV infection, approaches such as PAL in South Africa (PALSA Plus) will be promoted.

Models of prevention and care for chronic respiratory diseases in middle- and high-income countries will be different. They will target asthma, rhinitis, COPD, occupational lung diseases and pulmonary hypertension. Approaches will be developed from available management plans and international guidelines, according to specific country needs.

Key aspects of GARD action plans will be:

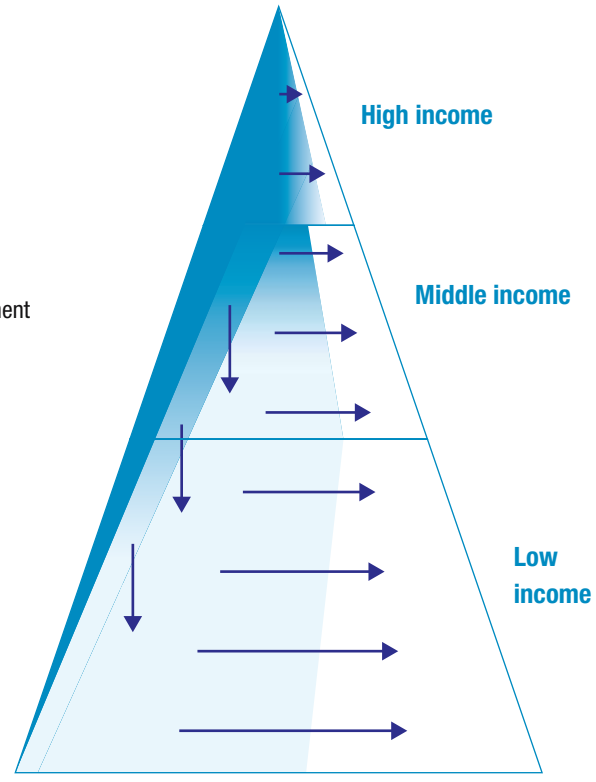
- To ensure the availability and accessibility of drugs for patients with chronic respiratory diseases in each treatment setting.
- To assist in knowledge translation strategies for the training of health-care workers in the management of chronic respiratory diseases, particularly the control of occupational chronic respiratory diseases and pulmonary hypertension.

Figure 24 Goals of chronic respiratory disease control, according to the income–level of the country

In high–income countries
- patients can receive adequate diagnosis and treatment
- but they are insufficiently diagnosed and treated
- a disease–specific approach is needed
- the goals of GARD are to better diagnose, treat and educate patients.

In upper–middle–income countries
- few patients can receive adequate diagnosis and treatment
- the first goal of GARD is to reduce under–diagnosis
- the second goal of GARD is to provide accessible and affordable treatment for all patients
- a syndromic approach (PAL) is needed in many places.

In lower–middle and low–income countries
- very few patients can receive adequate diagnosis and treatment
- the first goal of GARD is to reduce under–diagnosis
- the second goal of GARD is to provide accessible and affordable treatment for all patients
- a syndromic approach (PAL) is needed in most places.



The arrows indicate the goals of GARD

Control by disease-specific approach
Control by syndromic approach
No control

Box 8 Control of chronic respiratory diseases: potential synergies

To promote synergy among existing WHO and non-WHO activities, avoid duplication and overlap, and improve coordination in implementing GARD Country activities, GARD Basket will be developed, where existing WHO and non-WHO programmes will be offered to every country interested in a CD-Rom.

WHO activities

ILO/WHO Global Campaign for the Elimination of Silicosis

WHO occupational health (www.who.int/occupational_health/en/)

WHO Practical Approach to Lung Health (PAL) and the WHO Practical Approach to Lung Health in South Africa (PALSAPlus) (*448, 449*).

Other activities

National programmes for asthma and COPD (see Table 19).

Box 9 The WHO Practical Approach to Lung Health (PAL) and the WHO Practical Approach to Lung Health in South Africa (PALSA) Plus

The Practical Approach to Lung Health (PAL) strategy has been developed by WHO to improve the quality of tuberculosis (TB) diagnosis, increase TB case detection among respiratory patients, and improve the diagnosis and care of patients with common respiratory diseases (*448, 449*). Thus, PAL forms part of both the Stop TB (*376*) and the GARD strategies. In settings where the prevalence of HIV is high, PAL may be adapted to assist clinicians in the primary care management of patients with HIV/AIDS.

Rationale for the development of the Practical Approach to Lung Health

Globally, respiratory conditions rank first or second among reasons for patients' seeking care at primary health-care facilities and account for up to one third of patients seen at these facilities. Tuberculosis is diagnosed in only a small proportion (≤ 2%) of these patients, and for other common respiratory diseases, facilities and guidelines for the correct diagnosis and management are often non-standardized, empirical and inadequate, resulting in under-recognition of certain diseases (such as asthma and COPD) or inappropriate treatment (for example, over-use of antibiotics). Since symptoms of cough and breathlessness are common to most major respiratory diseases, the PAL approach is to use these symptoms to recognize potential respiratory disease (including tuberculosis), and to guide correct diagnosis and management through use of an integrated standardized evidence-based guideline tailored to the needs of front-line clinicians in each region or country setting.

Features of the Practical Approach to Lung Health strategy

The PAL strategy is the syndromic diagnosis and integrated management of patients with respiratory symptoms. It focuses on patients aged 5 years and over in the primary health care setting. Respiratory diseases to which the strategy accords priority include :

- Tuberculosis.
- Acute respiratory infections, particularly pneumonia.
- Chronic respiratory diseases, mainly asthma and COPD.

The PAL strategy aims to improve the quality of care of every patient, seeking care for respiratory symptoms and improving the efficiency of the health services caring for such patients. The PAL approach needs to be

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BOX 9 (CONTINUED)

adapted in each country to accommodate and conform to national health policies and health priorities, and to be based on epidemiological realities and specificities, as well as on the health resources available within each country.

Components of the Practical Approach to Lung Health strategy

Key components of the PAL strategy are standardization of diagnosis, management and follow-up of respiratory patients through the adaptation and development of integrated clinical practice guidelines, and coordination between the primary care (first level) health facilities and referral levels within the district health system. In each country, the latter requires the coordinated involvement of many elements within health care services, particularly those responsible for primary health care, the essential drugs programme, the national tuberculosis programme, the HIV/AIDS programme and health management information systems.

Implementing the Practical Approach to Lung Health strategy at country level

The development of the PAL strategy involves the following steps:

- Political commitment from national health authorities to adapt, develop and implement PAL.
- Formation of a national working group, comprising all key stakeholders in health care, to adapt, develop, plan, implement and fund the PAL strategy.
- Assessment of the health care environment, including national health priorities, health infrastructure and resources, funding procedures and institutional mechanisms that might facilitate the development and implementation of PAL, and potential barriers to the development and implementation of PAL at each level of the health-care chain.
- Adaptation of the PAL clinical practice guidelines and training material.
- Identification of pilot sites that can be used to audit the impact of the PAL intervention, bearing in mind that the audit should cover improvements in quality of care and health outcomes, as well as improvements in disease management and their outcomes.
- Development, with the relevant health authority, of a multi-year and stepwise plan (including costs) for wider implementation of PAL.
- Exploration, with national health authorities, of potential sources of funding for rolling out PAL (possible sources include government, regional administration, health sector reform funds, donors, or bilateral or multilateral cooperative agreements).
- Implementation of PAL should preferably be led by a clearly identified unit under the leadership of a ministerial entity such as the national tuberculosis programme or primary health care department.
- Establishing a monitoring and evaluation system to assess the quality and performance of PAL activities.

Potential impact of the Practical Approach to Lung Health strategy at the country level

The development and implementation of PAL is under way in approximately 30 countries and some results are already available (*22, 375*). Experience to date suggests that PAL is likely to:

- Improve tuberculosis detection and the quality of tuberculosis diagnosis (*22*).
- Strengthen the integration of tuberculosis control services within primary health care.
- Improve the diagnosis and care of patients with other priority respiratory diseases through the provision of an integrated health-care package (*22*).

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BOX 9 (CONTINUED)

- **Improve the referral system for patients with respiratory conditions requiring higher levels of care.**
- **Increase primary health care attendance for respiratory conditions.**
- **Help national health authorities cope with the health sector reform through standardization of respiratory care and identification of the required health resources.**
- **Improve planning and health resource management.**
- **Reduce drug prescription, particularly antibiotics and adjuvant drugs.**
- **Improve the quality of drug prescription for chronic respiratory disease patients.**
- **Reduce the average cost of drug prescription per respiratory patient in some settings.**

The Practical Approach to Lung Health in high-HIV prevalence countries (PALSA Plus)

In countries with a high burden of HIV, the PAL strategy may be adapted further to include the diagnosis and care of patients with HIV-related diseases and infections, even at the primary care level (*22*). Whereas in most countries, HIV treatment, especially the administration of antiretroviral drugs, is viewed as a specialized service, in the worst affected countries, the majority of care is provided at primary care level, in particular for respiratory infections or complications (upper and lower respiratory tract infections, *Pneumocystis* pneumonia, tuberculosis). One such adaptation, PALSA Plus, has been piloted and introduced in some regions of South Africa (*22*).

HIV-care offered (or potentially offered) by PALSA Plus includes:

- **Syndromic diagnosis of common and opportunistic infections, with where necessary the early introduction of antibiotics and referral to the next level of care.**
- **Voluntary confidential counselling and testing for HIV infection.**
- **Post-exposure prophylaxis with antiretroviral treatment.**
- **Monitoring of drug adherence for tuberculosis, isoniazid, prophylaxis, co-trimoxazole prophylaxis, and antiretroviral treatment drugs.**
- **Collection of routine monitoring specimens (CD4 counts, lactic acid levels and other safety investigations, as well as sputum examination for the success of tuberculosis treatment).**

GARD will produce the following deliverables:

Asthma

An asthma action plan has already been proposed by the ministry of health in countries such as Brazil, Finland (*450*), France (*451*), Portugal, and the United States (www.nhlbi.nih.gov/guidelines/asthma). The results of the action plans are generally impressive. They have reduced morbidity and mortality attributable to asthma in high-income (*58*) and low- and middle-income countries as well as in deprived areas (*60, 75, 76*). In Finland, however, the plan had no effect on the prevalence of the disease, which is still increasing.

GARD's activities are based on available guidelines, updated with the latest knowledge on asthma. In particular, treatment should no longer be based only on severity (*50, 452*), but also on control (*436*) and treatment needs (*453*).

Many guidelines are available for the management of asthma. These include GINA (*50*), NAEPP (*454, 455*), ARIA (*51, 456*), IPAG (www.theipcrg.org/guidelines/ipag_backgrounder.php), IPCRG (*457–461*), BTS (*462*) and other national guidelines (*436*). For low- and middle-income countries, the International Union against Tuberculosis and Lung Diseases has developed a guide for asthma management focusing on the WHO list of essential drugs (*23*).

Occupational asthma is discussed on page 51.

GARD expects that its efforts will produce the following results:

- Maintenance of capacity for school and work, and functional capacity of people with asthma.
- Improvement of health status.
- Reduction in hospitalizations and stays in an intensive care unit – these results cannot be demonstrated in many low- and middle-income countries where patients are not hospitalized for asthma or where hospitalizations or visits to emergency departments are not recorded (*13, 59*).
- Reduction in asthma deaths – this result cannot be demonstrated in many low- and middle-income countries where mortality rates are not recorded (*13, 59*).
- Optimization of management effectiveness.

GARD will promote national action plans that follow the guidance below.

Improve surveillance and awareness of asthma and its risk factors. Patient education programmes should increase awareness, and eliminate social stigma and misconception in the community regarding asthma. Knowledge about the prevailing perception in the community would be the first step in achieving this (*463*). A particular effort is needed in schools, where nurses should be able to recognize undiagnosed asthma and improve the implementation of asthma management plans (*464–466*).

Start early effective treatment according to the patient's control of asthma and current medications, win the patient's confidence and follow up the efficacy of the treatment. The goal is asthma control (*436, 462, 467–470*). Achieving asthma control reduces exacerbations (*471, 472*). Early controller therapy may be important for the optimal management of asthma (*473*). Guidelines for the treatment of asthma should be tailored to the country's needs, health system, and drug availability and accessibility. It has been found, in practice, that guidelines for asthma are not well implemented, partly because they are complex and, possibly, because treatment based on severity may not meet the patient's needs. Asthma care in general practice should be promoted to reduce barriers (*474, 475*). At follow-up, if the patient is not controlled, it is important to check compliance and inhalation technique.

Recognize and treat acute exacerbations early. Asthma mortality continues to be a serious global problem in many parts of the world, and several risk

factors have been identified for fatal or near-fatal exacerbations (*476*). Early identification and treatment of an acute exacerbation is effective and may prevent death.

Consider asthma and rhinitis in the same patient. Most patients with asthma have rhinitis, and many patients with rhinitis have asthma. Patients with persistent allergic rhinitis should be evaluated for asthma by taking a history of symptoms, chest examination and, where necessary, the assessment of airflow obstruction before and after bronchodilator. Patients with asthma should be appropriately evaluated (taking a history and doing a physical examination) for rhinitis. In terms of efficacy and safety, a combined strategy should ideally be used to treat the upper and lower airway diseases (*51*).

Educate the patient, preferably providing a written management plan. Non-adherence to treatment advice is common in asthma and accounts for a significant proportion of morbidity. Asthma education and self-management are recommended. Educational programmes that offer information about asthma but not self-management skills are not very effective (*477, 478*). Training programmes that enable people to adjust their medication using a written plan appear to be more effective (*479*); but further results are needed to fully assess the value of such plans (*480*).

Educate health-care professionals. This is an essential step, since the use of appropriate methods depends on appropriate training (481). Educational programmes should be targeted to the needs of the country or region concerned, and should be assessed.

Chronic obstructive pulmonary disease

A COPD action plan has already been proposed by the ministry of health in countries such as Finland (*482*), France (*483*) and Portugal.

GARD supports action plans updated with the latest knowledge on COPD, such as the ATS/ERS (*106*), GOLD (*107, 484*), NICE (*485, 486*), IPAG (www.theipcrg.org/guidelines/ipag_backgrounder.php), IPCRG (*432, 461, 462*) or other national guidelines (*482, 487–492*). Guidelines should be locally adapted by a working group of health professionals, and should be agreed between the ministry of health, WHO and the GARD Country Coordinator.

GARD expects that its activities will produce the following tangible results in terms of the prevention and control of COPD:

- Decrease in the occurrence of COPD in the general population, in particular by reducing risk factors and by improving home, work and school environment.
- Diagnosis of patients in early stages of COPD.
- Maintenance of capacity for work and functional capacity of patients with COPD.
- Improvement of the health status of patients with COPD.

- Reduction in the percentage of patients with moderate to severe COPD.
- Cessation of deterioration – or decline in the rate of deterioration – of pulmonary function.
- Reduction in complications of the disease and deaths.
- Optimization of management effectiveness.

GARD will support national action plans that follow the approach below.

Improve the surveillance and awareness of COPD and its risk factors, in the general population and in key groups. COPD, even more than asthma, is under-diagnosed and under-recognized (*494, 495*), in particular in low- and middle-income countries. General awareness of COPD in the community is extremely poor. A particular effort is needed in key groups (smokers, occupational settings), where health-care workers should be able to recognize undiagnosed COPD. National campaigns are needed to promote the awareness of COPD and its risk factors.

Promote preventive measures. The primary prevention of COPD in the general population, and the secondary and tertiary prevention of COPD in key groups, are important worldwide, particularly in low- and middle-income countries. Preventive measures include:

- Prevention and cessation of smoking – morbidity (*496*), mortality (*497*) and decline in lung function are reduced in patients with early COPD who stop smoking (*498, 499*).
- Reduction in indoor air pollution.
- Reduction in work-related pollutants.
- Reduction of outdoor air pollutants.
- Prevention of recurrent respiratory infections in children.

Promote early diagnosis and active treatment, in particular among smokers and people who are exposed to risk factors. COPD is usually asymptomatic or presents few symptoms for many years before it is diagnosed. Pharmacological treatment should follow established guidelines (*106, 107, 500, 501*).

Recognize and treat exacerbations early. COPD is often associated with exacerbations of symptoms which may be life-threatening (*117, 502, 503*). COPD is often undiagnosed and may be revealed during an exacerbation, which may be severe. Early diagnosis and management of exacerbations can reduce hospitalizations and may also improve the natural course of COPD (*504*). Influenza vaccination can prevent the occurrence of exacerbations (*505*).

Start physical exercise and rehabilitation early; this should be planned individually and implemented as part of the treatment. The principal goal

of rehabilitation is to reduce symptoms, so as to improve quality of life and increase physical and emotional participation in everyday activities (*506–510*). Rehabilitation may only be cost-effective in patients with severe COPD (*511*).

Initiate oxygen therapy in patients with chronic respiratory failure. Oxygen therapy has been shown to increase survival among patients with chronic respiratory failure. Treatment should be in line with published recommendations (*106, 107, 512, 513*).

Monitor follow-up and considerer co-morbidities. There should be regular follow-up visits, and therapy should be adjusted appropriately as the disease progresses. It is important to consider concomitant conditions, such as bronchial carcinoma (*221, 514*), tuberculosis, sleep apnea syndrome (*515*), left-heart failure (*214*) and loss of bone density (*106, 107, 516*).

Educate the patient and improve guided self-care. Although patient education does not improve exercise performance or lung function, it may play a role in improving skills, ability to cope with illness, and health status (*106, 107, 517*).

Educate health care professionals.

Advocate for more scientific research.

Occupational lung diseases

About 45% of the world's population and 58% of the population over 10 years of age belong to the global workforce. Their work sustains the economic and material basis of society, which is critically dependent on their working capacity. Thus occupational health and the well-being of working people are crucial prerequisites for productivity and are of the utmost importance for overall socioeconomic and sustainable development (*518*).

GARD expects that its efforts will produce the following results:

- Reduction of risk factors at a level which they will not cause chronic respiratory diseases (or sensitization).
- Maintenance of capacity for work.
- Reduction in severe occupational chronic respiratory diseases.
- Reduction in deaths attributable to occupational chronic respiratory diseases.
- Optimization of management effectiveness.

GARD will support national action plans that follow the approach outlined below.

Improve the surveillance and awareness of occupational lung diseases. Within occupational settings, it is important to investigate the information provided by health-care workers and employees in order to improve the

detection of early onset of occupational lung disease. There is a great need to develop intervention strategies through adequate surveillance programmes in high-risk workplaces (*519*). In South Africa, the Surveillance of Work-related and Occupational Respiratory Diseases in South Africa (SORDSA) registry was established in 1996 to provide systematic information on occupational respiratory diseases (*520, 521*). This registry can be used as a model for other low- and middle-income countries.

Prevent exposure.

- Action should be taken by all employers and employees before exposure occurs, according to available recommendations.
- Exposure to asbestos dust should be avoided through substitution by alternative products. Exceptions (for example, pipes to ensure safe water and sanitation) should be considered for low-income countries with poor water supplies. .
- Exposure to silica dust should be reduced to comply with international standards, such as the International Labour Organization/WHO Global Campaign for the Elimination of Silicosis (*522*).
- Exposure to agents that may cause occupational asthma or COPD should be reduced.
- Use of positive pressure masks should be promoted for workers exposed to silica dust and other airborne particles.

Promote early diagnosis and active treatment. Occupational lung diseases should be confirmed by objective evidence. Chest radiographs are essential to confirm diseases caused by inorganic dust. International standards for interpreting chest radiographs should be adhered to. The diagnosis of occupational asthma is too often based only on a history of work-related symptoms and not sufficiently on objective evidence (*523*). Also, the diagnosis is generally made too late, resulting in the perpetuation of asthma despite termination of exposure. The long-term sequelae of occupational asthma can be avoided if the affected workers are removed early from exposure.

- Even though their specificity is low, chest radiographs should be carried out routinely and periodically in workers exposed to asbestos and silica dust, in order to detect lung fibrosis (*524*).
- In settings where workers are exposed to risk factors, they should be screened for early signs of sensitization, such as rhinitis (*519*), cough and asthma.
- If suspected, occupational asthma should be confirmed by objective testing (*523, 525*).
- In workplaces that may contribute to the onset of COPD, workers should be monitored at regular intervals, using spirometry.

- Once the diagnosis is confirmed, affected workers should be removed completely from exposure to risk factors, and adequate social rehabilitation programmes should be offered. A delay in ending exposure to risk may result in severe intractable chronic respiratory disease. Appropriate treatment of chronic respiratory disease should be initiated early.

Monitor the long-term follow-up, even in patients who are completely removed from risk factors. Unfortunately, many patients with occupational chronic respiratory diseases are diagnosed at a late stage. Their symptoms may not decrease; they may even worsen. In some cases, such as in patients with silicosis and asbestosis, chronic respiratory disease may occur several years after exposure to risk factors has ended. It is therefore important to follow up the patients regularly for several years after the diagnosis of chronic respiratory diseases even after exposure cessation.

Educate the patient and improve guided self-care.

Educate health-care professionals, in particular those working in the occupational setting. Health workers need to ask pertinent work-related questions to workers exposed to risk factors, in order to initiate timely investigations and referral (*526*).

Provide compensation for work loss. Occupational chronic respiratory diseases are often not adequately recognized as a problem in low- and middle-income countries, although their economic consequences are of major importance. In many low- and middle-income countries, occupational diseases are not compensated, and patients continue to work despite suffering from lung diseases of increasing severity.

Pulmonary hypertension

Idiopathic pulmonary arterial hypertension, also known as primary pulmonary hypertension, is very rare. Pulmonary arterial hypertension associated with other conditions, such as COPD, systemic sclerosis, congenital heart diseases, portal hypertension and HIV infection, affects millions of patients around the world. There are wide regional differences in pulmonary hypertension, depending on the cause.

GARD expects that its efforts will produce the following results:

- Increased number of management plans on pulmonary hypertension in high-prevalence areas.
- Maintenance of capacity for work in patients with pulmonary hypertension.
- Reduction in prevalence of intractable pulmonary hypertension and number of associated deaths.

GARD will support national action plans that follow the approach outlined below.

Increase knowledge about the risks for pulmonary hypertension and improve surveillance in high-prevalence areas and among people at risk. Awareness and surveillance of pulmonary hypertension are relevant in areas or populations where there is a high prevalence of schistosomiasis (Brazil, Egypt, South-East Asia, etc.), sickle cell disease or thalassaemia (Africa and in people of African origin worldwide, as well as in people from Mediterranean countries), among people living at high altitudes, and among people suffering from systemic sclerosis, congenital heart diseases, COPD or liver disease.

Promote early diagnosis and active treatment in high-prevalence areas and among people at risk.

- There are no early symptoms of pulmonary hypertension, but the diagnosis should be suspected in patients with increasing dyspnoea on exertion and a known cause of pulmonary hypertension, although lung-function tests may be normal.

- Simple tools help in screening populations at risk (electrocardiogram and chest X-ray).

- Echocardiography-doppler is a more accurate method of screening, allowing a non-invasive measurement of systolic pulmonary arterial pressure. Echocardiography could be performed in regional referral centres.

- A definite diagnosis of pulmonary hypertension requires invasive measurements (right-heart catheterization) in a tertiary referral centres (*263*).

- Much has been learned about pathophysiology, leading to the development of new medications, many of which are quite expensive but improve survival rates (*527*). Low-cost conventional therapy is of interest and includes anticoagulants (warfarin, heparin), calcium antagonists in a minority of patients who respond acutely to a vasodilator challenge (e.g. nifedipine, diltiazem), diuretics, and oxygen therapy (*528*). These low-cost treatments should be available for all patients with pulmonary hypertension.

Give priority to early diagnosis and treatment of all forms of infection in schistosomiasis. This will reduce the risk of pulmonary hypertension.

Box 10 The asthma drug facility initiative: controlling asthma by increasing drug accessibility

To increase the affordability of treatment, the International Union Against Tuberculosis and Lung Disease (the Union) launched a global asthma drug facility initiative to ensure essential good quality drugs for asthma treatment worldwide. This initiative could contribute largely to setting up adequate management of asthma patients in low- and middle-income countries.

Most people with asthma live in low- and middle-income countries and deprived areas. However, access to essential drugs is limited in these regions, often because of prohibitively high prices. Although the disease is common, many patients do not receive an adequate diagnosis and treatment, which exacerbates the condition and leads to additional costs with health resources utilization. A 1998 study found that inhaled beclomethasone was consistently available in only four out of eight countries surveyed (*17*). The cost of inhaled beclomethasone varied more than fivefold, and that of inhaled salbutamol more than threefold. In general, the highest prices were observed in the poorest countries. In all but two countries, the cost of one year of treatment for a case of moderate persistent asthma exceeded the monthly salary of a nurse. In addition, patients did not have any health insurance in six of the countries surveyed. These patients could not be treated with inhaled steroids (*17*).

One of the most important messages of the first World Asthma Meeting, held in 1999, was: "There is a huge need for an international action for making effective asthma therapy available in all countries all over the world" (*529*).

In 2002, another study demonstrated the high cost of inhaled beclomethasone in several countries and the possibility of dramatically decreasing this cost by pooling the purchase of a good quality generic medication (*530*).

In 2003, affordable essential asthma drugs were not reaching patients in low- and middle-income countries. The low affordability of essential asthma drugs remains the main barrier to adequate management of asthma. This has been confirmed by the preliminary results of the Global Asthma Survey on Practice: a study conducted in several countries as an audit in emergency rooms showed that the major factor associated with emergency visits is the low affordability for patients of the drugs used for the long-term treatment of asthma (P Burney, personal communication).

The Global Drug Facility for tuberculosis drugs in 2001 used pooled procurement from pre-qualified producers of anti-tuberculosis drugs, along with other purchasing and supply strategies (*531*). The cost of tuberculosis drugs continues to decrease with the creation of the Global Drug Facility, and an independent evaluation concluded that the Global Drug Facility had been vital for the successful expansion of the DOTS strategy in high-burden countries. Initially, countries received drugs as a grant from the Global Drug Facility, but now direct procurement by countries is becoming more common.

Based on this experience, a similar model has been introduced for the procurement of asthma drugs. The Union's standardized approach for the management of asthma, which uses only two inhaled medications – steroids and short-acting ß-agonists (*23*) – can be implemented in most low- and middle-income countries if affordable drugs are made available to all patients. The concept of an Asthma Drug Facility, recently proposed by the Union (*532*), could be introduced if the pharmaceutical companies that produce essential asthma drugs could provide these drugs at affordable prices for patients in low- and middle-income countries.

It has been proposed that the Asthma Drug Facility should be organized along the same lines as the Global Drug Facility, which pre-qualifies producers of essential asthma drugs to guarantee quality and obtain the lowest prices. The Asthma Drug Facility would pool procurement for low- and middle-income countries interested in direct procurement. The increased affordability of drugs for patients would rapidly lead to immense health benefits and huge improvements in asthma management in those countries. It would be critical, of course, to also provide technical assistance to these countries regarding asthma management, storage and the distribution of essential asthma drugs of proven good quality.

The rationale and description of the Asthma Drug Facility concept was published in an editorial in 2004 (*532*). The concept was presented at the Union's Africa Region Conference in February 2004 and prompted positive feedback from colleagues in low- and middle-income countries. The concept was presented at the Union World Conference in November 2004 and 2005 and was supported by several partners including WHO.

23. Paediatric Chronic Respiratory Diseases and Respiratory Allergies

KEY MESSAGES

- **Asthma and rhinitis are the most frequent chronic diseases in children.**
- **Asthma is underdiagnosed and undertreated in children worldwide. A previous specific WHO initiative in the field was not existing.**
- **In many low- and middle-income countries asthma exacerbations in children is a leading cause of admissions and emergency visits.**

Chronic respiratory diseases in children should be considered in the context of low-, middle- and high-income settings (Box 10), and GARD should set short-, medium- and long-term goals.

The most common respiratory problem in children under 14 years of age is acute respiratory distress, usually considered to be of infectious etiology. Respiratory infections differ widely between high-income countries where they are usually mild (*533*), and low- and middle-income countries where they cause an enormous burden and high death rate (*534, 535*), in particular in HIV-infected infants and children (*536*). However, several chronic diseases may mimic respiratory infection, such as asthma, cystic fibrosis, bronchiectasis and immune deficiencies.

The prevalence of childhood asthma ranges from 3% to 20% in different countries, according to the ISAAC report (*33*). Asthma usually starts before the age of 6 years. The most common chronic disease of childhood in many regions of the world, asthma disproportionately burdens many socioeconomically disadvantaged urban communities (*537*).

What GARD will do?

GARD will focus on asthma and rhinitis, the major chronic respiratory diseases in children.

- Asthma is under-diagnosed (*84, 537–539*) and under-treated in children worldwide (*540–542*).
- There are no existing WHO programmes on childhood asthma.
- Diagnosis in young children is difficult, since children at this age cannot cooperate to perform spirometry, and wheezing (a frequent symptom of asthma) can be caused by other diseases.
- Most children with asthma seek medical help during an asthma exacerbation, which primary care physicians often diagnose as respiratory infection.
- Although most cases of childhood asthma can be controlled with medication, many children with asthma still experience persistent symptoms. In low- and middle-income countries, acute

exacerbations of asthma are the leading cause of emergency department visits by paediatric patients.

- Comprehensive guidelines for the diagnosis and treatment of asthma in high-income countries are available (*450, 452*). GARD's asthma education plan should mainly address middle- to low-income countries, as well as low-income areas of high-income countries. Wide experience has already been gained from NAEPP and other programmes on inner city asthma (*60, 65, 75, 408, 543–548*).

Although significant efforts have been made in the past decade to increase awareness of childhood asthma and decrease its burden, there is still an urgent need to develop a simple and realistic asthma education plan to improve skills for identifying and managing asthma in childhood. This plan should be aimed at patients and caregivers, as well as health-care personnel.

In addition to GARD's goals and expected results in relation to adult asthma, specific needs exist in regard to childhood asthma. GARD will support national plans that follow the approach set out below.

Encourage studies on the prevalence of asthma and its risk factors. These studies should cover preschool children, children and adolescents in all countries (including rural areas) and use the respiratory module of the WHO Global Infobase.

Improve the identification of potential asthma patients.

- Many children, particularly in middle-income countries, visit a hospital emergency department for the first time during a severe exacerbation, often because there has been no previous medical diagnosis of asthma.

- In certain countries, physicians diagnose "wheezing" because the term "asthma" is pejorative.

- There is a need to improve the diagnosis and awareness of childhood asthma, particularly in emergency care settings.

- There is a need to improve the diagnosis of asthma, particularly in children under 5 years of age. Asthma often exists in children under 5 years of age, but it is difficult to diagnose and to differentiate from recurrent wheezing (*549*).

Provide a simple guide on how to treat children with asthma in high-low- and middle-income countries. This guide should be distributed in, primary health care centres, emergency rooms and pharmacies.

Educate health-care professionals on how to recognize asthma symptoms, and evaluate and manage a child who might have asthma.

Provide education for patients and caregivers. Educational programmes should be specifically designed for caregivers of infants and young children, school-age children and adolescents.

Prevent smoking initiation during adolescence. Prevention of smoking is a priority goal of any integrated approach to improving lung health, including asthma (*550*).

Box 11 Childhood illnesses

GARD's strategy should always be to aim at integrating actions within primary care. In paediatrics, there are various approaches.

WHO activities in the area of childhood illness

Integrated Management of Childhood Illness (IMCI). WHO and the United Nations Children's Fund have launched a global initiative to reform the health care received by sick children in low- and middle-income countries in order to prevent deaths (*374, 551–554*). The core intervention of IMCI is the integrated management of the five most important causes of childhood deaths: acute respiratory infections, diarrhoeal diseases, measles, malaria and malnutrition. Like other clinical guidelines, which are increasingly accepted in health systems in low- and middle-income countries, IMCI raises difficult quality issues (*551*).

Every effort should be made to integrate management of these acute diseases with that of overlapping chronic diseases such as asthma, often exacerbated by acute respiratory infections.

Other activities

National programmes for asthma. As a part of the Finnish national asthma programme, there is also a national programme on childhood asthma.

GARD will work on the development of the following tools for the diagnosis and management of childhood asthma:

- A handbook and algorithm on symptoms of asthma in children, to guide professionals in diagnosing asthma without the need for additional tests.
- A simple handbook on how to use laboratory data (where available) to confirm the diagnosis.
- A brochure for day-care providers and schoolteachers.
- A handbook for parents about asthma.
- An educational handbook for children.

24. Identify Policy Implementation Steps

KEY MESSAGES

- **GARD activities need to be implemented at national or regional levels.**
- **National or regional implementation plans needs to be tailored to the health priorities, health-care systems and resources of the country or region.**
- **Implementation plans should involve all stakeholders.**
- **Realistic implementation steps should be proposed.**

GARD supports policy implementation that follows the approach established in *Preventing chronic diseases: a vital investment* (*1*), with three main steps (Figure 21).

- **Implementation step 1** (CORE): interventions that are feasible to implement with existing resources in the short term.
- **Implementation step 2** (EXPANDED): interventions that are possible to implement with a realistically projected increase in, or reallocation of, resources in the medium term.
- **Implementation step 3** (DESIRABLE): evidence-based interventions which are beyond the reach of existing resources.

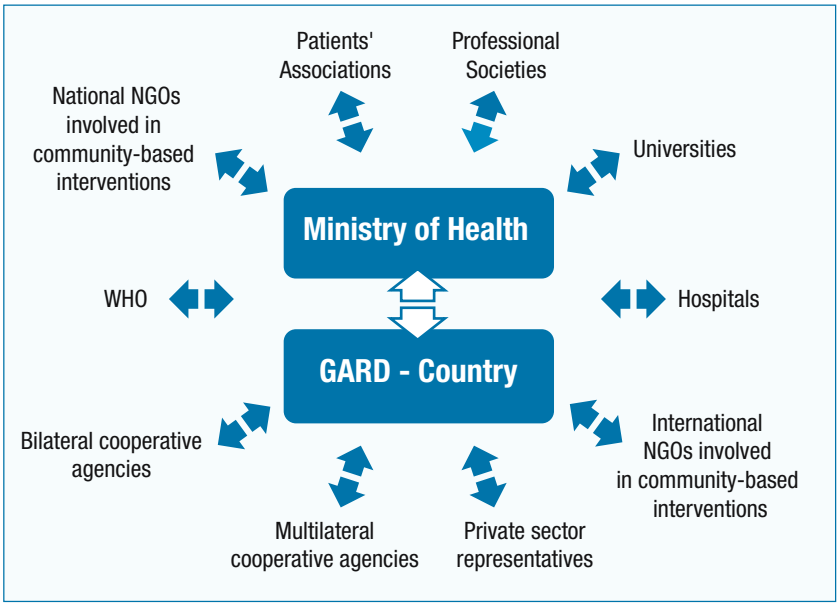
GARD focuses on the needs of countries, and fosters country-specific initiatives that are tailored to local conditions. In order for GARD's activities to meet the specific needs of countries, national alliances (GARD Country) might be established with a view to providing a coordination role and creating the necessary momentum to face the increasing impact of chronic respiratory diseases (Figure 25). GARD Country could act as an interface between GARD and the ministry of health to create a platform for all parties interested in chronic respiratory diseases in the country. The desired outcome at country level is to initiate or upgrade a programme on the surveillance, prevention and control of chronic respiratory diseases.

Alliances are shaped by the specific health problems and priorities as well as by the economic, political, cultural and social environment in which they work. GARD Country initiator and the core group of interested parties are usually best positioned to decide whether and how to attempt building an alliance at country level, in consultation with the ministry of health and with WHO chronic respiratory diseases and arthritis team that provide secretariat services to GARD.

In order for the national alliance to be sustainable, it should respond to the development needs of the country. GARD Country will respect the country's leadership and support national development and health sector strategies. The following are prerequisites to developing GARD Country:

- The situation of the surveillance, prevention and control of chronic respiratory diseases in the country is analysed.

Figure 25 GARD at country level



Box 12 Terminology

A GARD country initiator is a person or organization that has developed an initial idea and has taken the first step in formulating the approach of building an alliance at country level. The group of parties that is the most interested in the proposal is the core group of interested parties. Once GARD Country is established, GARD initiator might become GARD Country Coordinator, and the core group of interested parties as well as other interested parties the GARD Country collaborating parties.

- The Ministry of Health of the country is informed about GARD Country and invited to be involved with its development.

- The relevant WHO regional office and the WHO country representative have been informed and invited to be part of GARD Country.

Once the GARD Country initiator has verified that the prerequisites are in place, the following steps are proposed, and can be adapted.

1. Agreeing on a definition of alliance. GARD Country initiator and the core group of interested parties should agree on the term alliance and on its focus.

2. Nominating the GARD Country Coordinator. The WHO chronic respiratory diseases and arthritis team, after consultation with GARD Chairperson, GARD country initiator and the core group of interested parties, might propose GARD Country Coordinator for endorsement by the ministry of health. Alternatively, the ministry of health might nominate GARD country coordinator in agreement with GARD Chairperson and the WHO chronic respiratory diseases and arthritis team.

3. Identifying other potential interested parties. The GARD Country Coordinator, with the help of the core group of interested parties,

should invite as many other interested parties as possible to join GARD Country. After mapping the available resources, GARD Country Coordinator should consider to approach other interested parties, in order to fill the present gaps and help meeting the uncovered needs.

4. Running an exploratory workshop. The GARD Country Coordinator and the focal point within the Ministry of Health should call a workshop including the core group of interested parties and the other potential interested parties. The outcome of this workshop should be an agreement on the goal and objectives, the resources and competencies that each party could bring in, the proposed roles and responsibilities of each party, an outline of the project ideas that could be carried out collaboratively. Once the abovementioned is discussed and agreed upon, a GARD Country Coordinator shall appoint a sub-committee to draft the GARD Country Terms of Reference.

5. Defining the Terms of Reference. The sub-committee should draft the terms of reference of GARD Country. Even if the content of the terms of reference will vary a lot according to the country and the different situations, the draft should include:

   a. general goal: to reduce the burden of chronic respiratory diseases at country level, as part of the global goal to reduce the burden of chronic respiratory diseases worldwide;

   b. technical objectives: these should vary according to the local situation. In general, GARD Country will deal with:

   - coordination of existing activities related to chronic respiratory diseases;
   - exchanging relevant information on chronic respiratory diseases and their risk factors as well as on how to prevent and treat them;
   - advocating on chronic respiratory diseases and their risk factors as well as on how to prevent and treat them;
   - running intervention projects on surveillance, prevention and control of chronic respiratory diseases;
   - generating political commitment at country level;
   - raising additional resources.

The draft of the terms of reference should be circulated to all collaborating parties and to the ministry of health for comments. Once they all agree on the document, they should sign it.

6. Defining the structure: The collaborating parties should find the best way to govern the Alliance according to their various needs.

Here is an example:

a. GARD *Country council* is the plenary body where all GARD collaborating parties are represented. Decisions are taken by consensus. The country coordinator is the Chairperson.

b. GARD *Country planning group* is the proposing body composed of 3 to 5 collaborating parties elected by the council every 2 years. Decisions are taken by consensus. The country coordinator is the Chairperson.

c. GARD *Country secretariat* supports the GARD Country alliance and assists the collaborating parties. It is managed by the GARD Country coordinator and hosted by one of the collaborating parties selected by all the collaborating parties by consensus. The host organization provides a legal umbrella for the alliance which is not a legal entity. The secretariat follows the administrative rules and regulations of the host entity. However, it preserves its own budget and functions

d. GARD Country coordinator should work in close collaboration with GARD focal point within the ministry of health.

7. Reviewing the work of the Alliance: The GARD Country coordinator should review the work of the Alliance on a regular basis. She or he should ask questions on the process, output and outcome. The steps described above are aimed at helping countries to enter in the process of building alliances against chronic respiratory diseases at country level. By adopting this process, GARD Country will be an informed and, therefore, sustainable choice.