Chapter 5
Improving health care: individual interventions

In addressing noncommunicable diseases, the population-wide approach to prevention described in the previous chapter has great potential to decrease disease burden, but it does not provide an adequate response to the need to strengthen health care for people with NCDs. The disease burden can be reduced considerably in the short- to medium-term if the population-wide approach is complemented by health-care interventions for individuals who either already have NCDs or those who are at high risk (1–5).

As the *Global Strategy for the Prevention and Control of Noncommunicable Diseases* indicates, NCDs can best be addressed by a combination of primary prevention interventions targeting whole populations, by measures that target high-risk individuals and by improved access to essential health-care interventions for people with NCDs (2).

This chapter examines key issues related to the provision of health care and improved access to essential interventions, particularly in low- and middle-income countries. Health systems in many low- and middle-income countries are historically shaped around acute care and are inadequate when dealing with NCDs, which require chronic care (6). The long-term nature of many NCDs demands a comprehensive health system response that brings together a trained workforce with appropriate skills, affordable technologies, reliable supplies of medicines, referral systems and empowerment of people for self-care, all, over a sustained period of time. Currently, many low- and middle-income countries have health systems that do not meet the requirements for chronic care. In recent years, many of them have invested in vertical national programmes to address HIV/AIDS, tuberculosis and malaria. Positive as well as negative effects of these initiatives on health systems have been identified (7). While positive effects include rapid scale-up in service delivery for HIV/AIDS, tuberculosis and malaria, greater stakeholder participation, and channelling of funds to nongovernmental stakeholders, negative effects might include distortion of national priorities, distraction of governments from coordinated efforts to strengthen health systems, and re-verticalization of planning, management and monitoring and evaluation systems (7). Lessons learnt and capacities that have been developed through such initiatives need to be harnessed and synergized through better integration of communicable and NCD initiatives. In order to address the current gaps in programmes and services, within a coordinated process of overall health-system strengthening, national health programmes should be based on sound situation analyses and a clear understanding of national health priorities. Such approaches are particularly important in countries with a double burden of disease. The capacity of health systems to address the NCD challenge is also discussed in Chapter 6.

Currently, many low- and middle-income countries have health systems that do not meet the requirements for chronic care

Evidence from high-income countries

Over the past two decades, cardiovascular diseases (CVD) mortality rates have declined substantially in high income countries (8–12). There is clear evidence that population-wide primary prevention and individual health-care interventions have both contributed to these declining mortality trends (11, 12). For example, during the 10-year period covered by the Multinational Monitoring of Trends and Determinants of Cardiovascular Disease (MONICA) project coordinated by the WHO, mortality from coronary heart disease and stroke declined dramatically in many of the 38 MONICA populations (11). The decline in mortality has been attributed to reduced incidence rates and/or improved survival after cardiovascular events due to prevention and treatment interventions. Across all populations with declining coronary heart disease mortality, reduced cardiovascular risk contributed to 75% and 66% of the change in men and women respectively, the remainder being attributed to provision of health care resulting in improved survival in the first four weeks after the event. For stroke, about 33% of the changes in populations with declining mortality were attributed to reduced incidence and 66% to improved survival. These WHO MONICA data strongly support the view that population-wide primary prevention and individual health-care approaches go hand-in-hand to reduce the population burden of cardiovascular disease (11).

Cardiovascular mortality rates have declined substantially in high-income countries. The decline is due to both prevention and treatment interventions

There has been a dramatic decline in coronary heart disease mortality in the United Kingdom between 1981 and 2000 (12). Some 42% of this decrease has been attributed to treatment (including 11% to secondary prevention, 13% to heart failure treatment, 8% to initial treatment of acute myocardial infarction, and 3% to hypertension treatment). About 58% of the decline has been attributed to population-wide risk factor reductions (12).

With respect to cancer treatment, improvements in the outcome of a number of cancers have occurred in high-income countries (13). Progress in cancer treatment, often combined with early detection, greater access to care and screening interventions, have made it possible for a substantial proportion of patients with various cancer types (including breast, cervical, prostate and childhood cancers) to achieve significant long-term survival. Survival rates in low- and middle-income countries, however, are significantly lower (14), due both to more advanced disease at presentation and less-effective therapy, the quality of which is often correlated with the socioeconomic status of the country.

As the Global Strategy emphasizes, in all populations there will always be some people with medium- to high-risk for NCDs, so individual health-care interventions are needed for early detection, prevention and management (2). If individual health-care interventions are not accessible, those people will present at health-care institutions with acute events (e.g. acute myocardial infarction, stroke) or long-term complications (e.g. congestive cardiac failure due to hypertension and coronary artery disease and cardiovascular, renal, eye or neurological complications due to diabetes) (4, 5).

Provision of health care for NCDs in low- and middle-income countries

NCD levels in low- and middle-income countries are on the rise. If rising trends are to be halted and reversed, current approaches to addressing NCDs need to be changed. At present, the main focus of health care for NCDs in many low-and middle-income countries is hospital-centred. In the case of CVD, a large proportion of people with high cardiovascular risk remain undiagnosed (5, 15) and even those diagnosed have insufficient access to treatment at the primary health-care level (16). Similarly, the majority of people with diabetes have no access to essential health care unless primary health-care facilities are equipped to provide it; secondary and tertiary care facilities can only accommodate a small proportion of the diabetic population, and referral to such facilities is usually limited to patients with complications or those who require special management and care.

When an NCD diagnosis is made, it is often at a late stage of disease, when people become symptomatic and are admitted to hospitals with acute events or long-term complications and disabilities (17–19). When the stage of the disease is advanced, expensive high-technology interventions are required for treatment. Examples of such costly health-care interventions include coronary artery bypass surgery and other types of vascular surgery for unstable angina and cerebrovascular disease, laser surgery for diabetes retinopathy, renal dialysis and transplantation for end-stage renal disease and radiotherapy for advanced cancer.

In many countries, cancer patients have limited or no access to care due to delayed diagnosis, lack of trained oncologists and specialized nursing staff, as well as lack of diagnostic facilities such as pathology services, specialist equipment and drugs (13, 14, 19). Surgery remains the primary and often only treatment modality in low- and middle-income countries where there are insufficient radiation therapy facilities and intermittent availability of chemotherapy agents that, in any event, are often unaffordable. Over 60% of the world's radiotherapy facilities are serving only the 15% of the global population living in the affluent countries. Radiotherapy facilities in developing countries, with 85% of the global population, comprise less than half of the minimum requirements, with 36 countries lacking radiotherapy services entirely (20).

A particular concern in low- and middle-income countries is access to palliative care. The availability of oral morphine and staff trained in palliative care are limited in many low- and middle-income countries, even though these services can be made available at very low cost, so that most cancer patients die without adequate pain relief or psychosocial support (21).

Affordable tools (e.g. clinical measurements, simple laboratory investigations and cardiovascular risk assessment charts) are available for early detection of people with major NCDs and those at high risk (4, 5). Since most major NCDs are asymptomatic in early stages, such tools need to be proactively utilized to avoid delay in diagnosis. In settings where population-wide screening is not

affordable, targeted screening of people in specific situations (e.g. adults over a certain age threshold screened in primary care facilities, work sites and community settings) can be a useful approach used for early detection and diagnosis.

Effective individual health-care interventions for major NCDs

As mentioned above, treating patients in the later stages of NCDs is technology-intensive and expensive. Substantial additional public funding will be required if access is to be extended to high technology interventions (22). Currently, high-cost interventions result in high out-of-pocket spending and catastrophic expenditures for patients (23), which drive families into poverty. Therefore, a key strategic objective in the context of limited resources and the gaps in health systems is to improve access to cost-effective and sustainable health-care interventions that reduce the health and socioeconomic burden of NCDs.

Effective individual health-care interventions fall into three categories (4, 5, 24, 25). One pertains to acute events and should ideally be delivered in special units dealing with coronary care, stroke care or intensive care. A second category of health service interventions deals with complications and advanced stages of disease. They both require health workers with specific skills, high technology equipment, costly treatment and tertiary hospital infrastructure. By contrast, the third category of interventions can be applied at the first level of contact with the health system ; in primary care. These primary health-care interventions are essential for proactive early detection and providing the essential standards of care for the four major groups of NCDs, thereby reducing the demand for the first two categories of interventions (25). Improved access to highly cost-effective interventions at the primary health-care level will have the greatest potential for reversing the progression of the disease, preventing complications, and reducing hospitalizations, health-care costs and out-of-pocket expenditures.

Cardiovascular disease

For primary prevention of coronary heart disease and stroke, individual health-care interventions can be targeted to those at high total cardiovascular risk or those with single risk factor levels above traditional thresholds, such as hypertension and hypercholesterolemia (4). The former approach is more cost effective than the latter and has the potential to substantially reduce cardiovascular events (1, 4, 24, 25). Furthermore, application of this approach is also feasible in primary care in low-resource settings, including by non-physician health workers (25, 26). It has been estimated that a regimen of aspirin, statin and blood pressure-lowering agents may significantly reduce the risk of death from CVD in people at high cardiovascular risk (people with a 10-year cardiovascular risk equal to or above 15%, and those who have suffered a previous cardiovascular event) (27). Providing such a regimen to those eligible between 40–79 years of age has been estimated to avert about one fifth of cardiovascular deaths in the next 10 years, with 56% of deaths averted in people younger than 70 years (27). With effective management, the average yearly cost per head of implementing such a regimen has been estimated to range from US$ 0·43 to US$ 0·90 in low-income countries and from US$ 0·54 to US$ 2·93 in middle-income countries (27).

For secondary prevention of cardiovascular disease (prevention of recurrences and complications in those with established disease), aspirin, beta-blockers, angiotensin-converting enzyme inhibitors and lipid-lowering therapies lower the risk of recurrent cardiovascular events, including in those with diabetes (4, 28). The benefits of these interventions are largely independent, so that when used together with smoking cessation, about three quarters of recurrent vascular events may be prevented (28). Currently there are major gaps in the implementation of secondary prevention interventions that can even be delivered in primary care settings (29).

Aspirin, atenolol and streptokinase are medicines that significantly reduce the relative risk of dying from acute myocardial infarction (24, 30, 31). The incremental cost is less than US$ 25 per DALY averted worldwide for aspirin plus atenolol interventions (24). Similarly prophylaxis for rheumatic fever using benzathine penicillin injections to prevent recurrences and rheumatic valve disease is a cost-saving intervention that can be delivered in primary care settings (25, 32).

Cancer

As highlighted in Chapter 4, comprehensive cancer control encompasses primary prevention, early detection/screening, treatment and palliative care (33). Cost-effective interventions are available across the four broad approaches to cancer prevention and control (24, 25, 33–38). Prevention interventions for cancer are discussed under population-wide interventions. Early detection and screening for cancer have also been covered in Chapter 4 and provide an important complement to primary prevention. Population-based screening for common cancers is also discussed in Chapter 4.

Early diagnosis is essential to reducing cancer morbidity and mortality since cancer stage at diagnosis is the most important determinant of treatment options and patient survival. Early detection is based upon awareness of early signs and symptoms. In a population where the majority of the cancers are diagnosed in late stages, the establishment of an early diagnosis programme is an effective strategy to reduce the proportion of advanced stages and improve survival rates for selected cancers that may be amenable to effective treatment with limited resources (e.g. cervical, breast, oral or skin cancers) (25, 33–38).

The main goals of a cancer diagnosis and treatment programme are to cure or considerably prolong the life of patients and to ensure the best possible quality of life to cancer survivors. The most effective and efficient treatment programmes are those that: a) are provided in a sustained and equitable way; b) are linked to early detection; and c) adhere to evidence-based standards of care and a multidisciplinary approach. Such programmes also ensure adequate therapy for cancer types that, although not amenable to early detection, have high potential for being cured (such as metastatic seminoma and acute lymphatic leukaemia in children), or have a good chance of prolonging survival in a significant way (such as breast cancer and advanced lymphomas).

The first critical step in the management of cancer is to establish the diagnosis based on pathological examination. A range of tests is necessary to determine the spread of the tumour. Staging often requires substantial resources that can be prohibitive in low-resource settings. Because of late diagnosis, however, a consequence of poor access to care, most patients have advanced disease in such settings (14).

Once the diagnosis and degree of spread of the tumour have been established, to the extent possible, a decision must be made regarding the most effective cancer treatment in the given socioeconomic setting. This requires a careful selection of one or more of the major treatment modalities – surgery, radiotherapy and systemic therapy – a selection that should be based on evidence of the best existing treatment given the resources available. Surgery alone, and sometimes radiation alone, is only likely to be highly successful when the tumour is localized and small in size. Chemotherapy alone can be effective for a small number of cancers, such as haematological neoplasms (leukaemias and lymphomas), which can generally be considered to be widespread from the outset. Combined modality therapy requires close collaboration among the entire cancer care team.

Palliative care is essential and effective for adequate symptom control and management of pain in cancer patients, in particular but not exclusively for those in the terminal stage. Patients living with and dying from cancer have the fundamental right to do so with dignity and comfort, irrespective of their disease or where they live. Unfortunately, access to care, oral morphine and staff trained in palliative care is limited in many low- and middle-income countries, so that most cancer patients die without adequate pain relief.

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Pain management must include adequate access to appropriate pain medication. Experience from developing countries confirms that oral morphine is an effective and safe method of managing cancer pain in low- and middle-income countries (21). A recent Cochrane review confirmed that oral morphine is an effective analgesic for moderate to severe cancer pain (39).

WHO has spearheaded the application of pain relief and palliative care in many low- and middle-income countries by providing an analgesic ladder for relief of cancer pain and guidance for the implementation of effective palliative care for cancer (40). Of the several models for palliative care in low- and middle-income countries, those that have been successful rely on community-based programmes and home-based care (40).

Diabetes

There are several interventions for prevention and management of diabetes that have a strong evidence base (Table 1). At least three reduce costs while improving health (24, 25, 41). These are blood pressure control (when blood pressure is above 130/80 mmHg), glycaemic control (in people with HbA1c >9%) and foot care for people with a high risk of ulcers. Blood pressure control in people with diabetes has been demonstrated to be highly effective in reducing the risk of cardiovascular complications as well as retinopathy and nephropathy. In resource-poor settings, it is estimated that blood pressure control is one of the most feasible and cost-effective interventions in people with diabetes.

Table 1. Individual interventions in diabetes with evidence of efficacy (24)

Interventions with evidence of efficacy	Benefit
Lifestyle interventions for preventing type 2 diabetes in people at high risk	Reduction of 35–58% in incidence
Metformin for preventing type 2 diabetes for people at high risk	Reduction of 25–31% in incidence
Glycaemic control in people with HbA1c greater than 9%	Reduction of 30% in microvascular disease per 1 percent drop in HbA1c
Blood pressure control in people whose pressure is higher than 130/80mmHg	Reduction of 35% in macrovascular and microvascular disease per 10 mmHg drop in blood pressure
Annual eye examinations	Reduction of 60 to 70% in serious vision loss
Foot care in people with high risk of ulcers	Reduction of 50 to 60% in serious foot disease
Angiotensin converting enzyme inhibitor use in all people with diabetes	Reduction of 42% in nephropathy; 22% drop in cardiovascular disease

Chronic respiratory disease

The major chronic respiratory diseases are asthma and chronic obstructive pulmonary disease. Standard treatment consists of inhaled salbutamol for intermittent asthma and inhaled salbutamol and corticosteroids for persistent asthma (24, 25). In addition to inhaled salbutamol, inhaled corticosteroids and ipratropium bromide are recommended for moderate to severe chronic obstructive pulmonary disease (24). Due to cost considerations, it may not be feasible to make inhaled ipratropium bromide available in low-resource settings.

In many low-income countries, drugs for inhalation use, such as inhaled steroids, are still not accessible. The International Union against Tuberculosis and Lung Disease has recently developed a drug procurement mechanism called the Asthma Drug Facility (42), for inhaled medications for asthma patients. Countries can explore procurement of quality-assured inhaled drugs at affordable costs from the Asthma Drug Facility in order to improve access to inhaled steroids and salbutamol.

In countries with non-negligible TB prevalence, many patients seek care for respiratory symptoms related to post-TB chronic lung disorder. WHO has developed, in the framework of the Stop TB Strategy, the Practical Approach to Lung Health (43) that aims to improve respiratory care in primary health-care settings. This approach could be usefully linked to the integrated implementation of the package of essential NCD interventions in primary care settings (25).

Self-care programmes

Self-care programmes are seen as a vital form of prevention in those at high risk and in improving outcomes in people with NCDs. They have also been shown to reduce demand on health services and thereby cut costs of care (44). Self-care is defined by WHO as including "activities that individuals,

families, and communities undertake with the intention of enhancing health, preventing disease, limiting illness and restoring health".

Techniques and approaches used in self-care programmes include the "patient as the expert" approach, nurse-led programmes, home self-monitoring techniques and programmes using new information technologies, such as mobile phones, computer networks, web-based tools and telemedicine. In general, self-care programmes aim to increase the interest and involvement of people in their own care, and by doing so, empower them to manage their condition. They use educational or self-management interventions to improve patients' management of their conditions. These interventions are designed to impart knowledge and skills to enable patients to participate in decision-making, to monitor and control the disease and to change behaviour. Published literature demonstrates that patient education for self-care can provide benefits in terms of knowledge, self-efficacy and health status (45). Although the amount of scientific enquiry into the direct associations between increased health literacy and improved health outcomes on NCD-related health outcomes is scant, the impact of health education, an important component of self-care, is known (46), particularly in smoking cessation interventions directed towards individual smokers through individual and group counselling and mass education (47, 48). The effectiveness of individual patient education in the management of diabetes has also been reported to be positive (49) but it is not yet supported by quality evidence (50).

Effective delivery of individual health-care interventions

As explained above, complications that require costly high technology interventions occur in advanced stages of NCDs. Therefore, to improve efficiency, health-system policies should prioritize interventions that are essential for preventing the progression of NCDs (25). For example, by prioritizing access to interventions for assessment and management of high cardiovascular risk, health-care costs related to heart attacks, strokes and revascularization procedures can be reduced (25, 51). Similarly, early diagnosis and treatment of diabetes can prevent diabetic nephropathy and the need for costly renal dialysis (24, 25). Not only do such policies reduce public sector spending on high technology care, they also protect people from catastrophic expenditure.

Gaps exist in all building blocks of health systems: governance; policies and plans; health care delivery; health information systems; health workforce; and access to essential technologies and medicines. Countries will need to address these gaps

The delivery of effective NCD interventions is determined by the capacity of health-care systems. As mentioned before, health systems in many countries are weak in providing the required standards of health care for people with NCDs and there are major gaps in capacity. The gaps exist in all building blocks of health systems: governance; policies and plans; health-care delivery; health information systems; health workforce; and access to essential technologies and medicines. Countries will need to address these gaps in their quest to strengthen health systems and improve NCD health care. A more detailed review of the current situation approaches to address the key gaps is included in Chapter 6.

Effective delivery of individual health-care interventions also depends on accuracy of diagnosis, population coverage, population eligibility, patient adherence to treatment and professional practice (52). In order to maximize effectiveness, barriers to implementation of cost-effective interventions need to be identified and overcome, particularly in primary care. Further, the development of partnerships among health-care providers, patients, families and communities as well as collaboration between public and private health-care sectors, are also likely to be important in enhancing continuity of care required for ensuring effectiveness of individual interventions (53).

Several studies (6, 54, 55) have documented the common inefficiencies and inadequacies in the performance of health systems, which also influence delivery of NCD interventions. First, there is often excessive and inappropriate use of technologies, medicines and costly invasive procedures. Second, there is lack of focus on efficiency. Third, there is failure to operate at the appropriate scale, e.g. underutilization of primary-care facilities and maintaining hospitals with low occupancy rates. Finally, there is a failure to remunerate staff adequately to encourage good performance and offer them incentives to work in rural locations and in primary care.

There are lessons to be learnt from the experience of maternal and child health and communicable disease initiatives on effective approaches to address health system constraints (6). Experience from these initiatives demonstrates that if there is political commitment and favourable public policy, structural constraints can be relaxed through a modest injection of resources. Constraints that

have been shown to be amenable to infusion of new funds include staff, infrastructure, equipment, medicines and supplies and strengthening of planning and budgeting systems. An integrated human resources strategy and decentralization of managerial authority to local levels are also important. Such an integrated human resources strategy needs to look at training and skills requirement, working conditions, performance monitoring and supervision and the development of a coherent career structure.

Strategic choices for improving access to individual health-care interventions

Robust evidence exists for the efficacy of a wide range of health service interventions in reducing morbidity and mortality in people with major NCDs. Most of the interventions referred to in the previous sections of this chapter are cost effective for wide application across the different levels of health systems in developed countries. For low- and middle-income countries, however, the options are more limited due to constraints in resources and weak health system capacity (25). Competing health priorities further complicate prioritization of health service interventions in low- and middle-income country contexts. Given these constraints, and the urgent need to contain the rising epidemic of NCDs, low- and middle-income countries need to prioritize investment of available resources in individual health-care interventions that will provide a good return (**best buys**); very cost-effective individual interventions that are feasible for implementation on a wide scale can also have a high impact.

As mentioned in Chapter 4, an intervention is defined as 'very cost-effective' if it is capable of generating an extra year of healthy life or averting a DALY for less than the average annual income per person in the resource setting where it will be applied. Interventions that produce a healthy life year for more than that but still less than three times average per capita income can still be considered 'cost-effective' (56). To be considered a **best buy**, an intervention also needs to be financially affordable (e.g. costing no more than one US dollar per capita population each year in lower-income countries) and pragmatic and feasible to implement in close to client, non-specialized health-care settings.

As listed in Table 2, among the cost-effective interventions that target people with disease and at high risk, there are several **best buys** (very cost-effective, high impact, affordable and feasible interventions) for low- and middle-income countries. For example, counselling and multidrug therapy (including glycaemic control for diabetes) for people with a 10-year risk of fatal or non-fatal cardiovascular events ≥ 30%, and aspirin treatment for acute myocardial infarction together, have the potential to reduce the cardiovascular disease burden by 37%, and comprise a combined a **best buy**. Similarly, early detection and treatment of lesions of early stage cervical cancer are a **best buy** that will reduce the cancer burden by 5%.

Table 2. Health care interventions to tackle noncommunicable diseases: identifying 'best buys'

Disease (% global burden; DALYs [a])	**Interventions / actions** (* core set of 'best buys')	**Avoidable burden** *(DALYs averted, millions)*	**Cost–effectiveness** [b] *(US$ per DALY prevented) [Very = < GDP per person; Quite = < 3* GDP per person Less = >3* GDP per person]*	**Implementation cost** *(US$ per capita) [Very low = < US$ 0.50; Quite low = < US$ 1 Higher = > US$ 1]*	**Feasibility** *(health system constraints)*
Cardiovascular disease (CVD) and diabetes (170 m DALYs; 11.3% global burden)	**Counselling and multidrug therapy (including glycaemic control for diabetes mellitus) for people (≥30 years), with 10-year risk of fatal or nonfatal cardiovascular events ≥ 30% * [c]**	60 m DALYs averted *(35% CVD burden)*	Very cost-effective	Quite low cost	Feasible (primary care)
	Aspirin therapy for acute myocardial infarction *	4 m DALYs averted *(2% CVD burden)*	Very cost-effective	Quite low cost	
	Counselling and multidrug therapy (including. glyceamic control for diabetes mellitus) for people (≥ 30 years), with a 10-year risk of fatal and nonfatal cardiovascular events ≥ 20%	70 m DALYs averted *(40% CVD burden)*	Quite cost-effective	Higher cost	
Cancer (78 m DALYs; 5.1% global burden)	**Cervical cancer screening (VIA), and treatment of pre-cancerous lesions to prevent cervical cancer***	5 m DALYs averted *(6% cancer burden)*	Very cost-effective	Very low cost	Feasible (primary care) Treatment may require referral
	Breast cancer – treatment of stage I	3 m DALYs averted *(4% cancer burden)*	Quite cost-effective	Higher cost	Not feasible in primary care
	Breast cancer – early case-finding through biennial mammographic screening (50–70 years) and treatment of all stages	15 m DALYs averted *(19% cancer burden)*	Quite cost-effective	Higher cost	
	Colorectal cancer-screening at age 50 and treatment	7 m DALYs averted *(9% cancer burden)*	Quite cost-effective	Quite low cost	
	Oral cancer – early detection and treatment	Not established globally	Not assessed globally	Not assessed	
Respiratory disease (60 m DALYs; 3.9% global burden)	Treatment of persistent asthma with inhaled corticosteroids and beta-2 agonists	Not established globally *(expected to be small)*	Quite cost-effective	Very low cost	Feasible (primary care)

[a] DALYs (or disability-adjusted life years) are widely used as a measure of premature mortality and ill-health - one DALY can be thought of as one lost year of healthy life.
[b] Prevention and control of NCDs: priorities for investment. Discussion paper for the First Global Ministerial Conference on Healthy Lifestyles and Noncommunicable Disease Control. Geneva, World Health Organization, 2011.
[c] Includes prevention of recurrent vascular events in people with established coronary heart disease and cerebrovascular disease.

Prioritizing and financing the core set of **best buys** may be a pragmatic first step to achieving the long-term vision of universal coverage (25, 57). Countries will need to make their own choices regarding other essential health-care interventions to address major NCDs. While a comprehensive set of cost-effective interventions could be implemented in a high-income country (58), what is feasible in low- and middle-income countries will depend on the level of health-care spending, competing health priorities and the capacity of the health system.

In order to make progress, two key issues require consideration at the country level: a) identifying constraints for delivering NCD interventions and options available to deal with them; b) determining the total costs of expanding coverage of **best buys** and other essential NCD interventions and sustaining them. An in-depth understanding of the type, severity and range of constraints will be invaluable for countries in making these strategic choices.

Key messages

- A range of cost-effective interventions is essential to proactively detect and effectively treat individuals with noncommunicable diseases, and protect those who are at high risk of developing them.
- When cost-effective health-care interventions are complemented with population-wide prevention strategies, a significant impact can be made on the global NCD epidemic.
- To improve efficiency, health-system policies should prioritize interventions that are essential for preventing the progression of NCDs. Limited resources and weak health systems in low- and middle-income countries, demand prioritization of a package of essential NCD interventions including **best buys** (high impact, very cost-effective, affordable and feasible interventions).
- Financing and strengthening health systems to deliver the **best buys** through a primary health-care approach is a pragmatic first step to achieve the long-term vision of universal coverage.

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