

Preventing
CHRONIC DISEASES
a vital investment



**World Health
Organization**



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part three

WHAT THE EVIDEN



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WORKS: EVIDENCE FOR ACTION

The knowledge exists now to prevent and control chronic diseases. This part of the report provides a summary of the evidence, and explains how interventions for both the whole population and individuals can be combined when designing and implementing a chronic disease prevention and control strategy.

key messages

- » **Chronic diseases can be prevented and controlled using available knowledge**
- » **Comprehensive and integrated action is required**

face to face

WITH **CHRONIC DISEASE**



**MILTON PAULO
FLORET FRANZOLIN**
“I don’t want to be a victim
but a fighter”

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ZAHIDA BIBI
Suffering from
preventable
complications

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1 A strategy to achieve rapid results

Population-wide approaches seek to reduce the risks throughout the entire population. They address the causes rather than the consequences of chronic diseases and are central to attempts to prevent the emergence of future epidemics. Small reductions in

the exposure of the population to risk factors such as tobacco use, unhealthy diet and physical inactivity lead to population-level reductions in cholesterol, blood pressure, blood glucose and body weight. More fundamentally, interventions are also required to address the underlying determinants of chronic disease, as described in Part Two.

- » **Rapid health gains can be achieved with comprehensive and integrated action**
- » **In this way, many countries and regions have already successfully curbed chronic diseases**

Interventions for individuals focus on people who are at high risk and those with established chronic disease. These interventions reduce the risk of developing chronic disease, reduce complications, and improve quality of life.

Population-wide and individual approaches are complementary. They should be combined as part of a comprehensive strategy that serves the needs of the entire population and has an impact at the individual, community and national levels. Comprehensive approaches should also be integrated: covering all the major risk factors and cutting across specific diseases.

RAPID HEALTH GAINS CAN BE ACHIEVED

It is not necessary to wait decades to reap the benefits of prevention and control activities. Risk factor reduction can lead to surprisingly rapid health gains, at both population and individual levels. This can be observed through national trends (in Finland and Poland, for example, as described on page 93), sub-national epidemiological data and clinical trials.

In the case of tobacco control, the impact of proactive policies and programmes is almost immediate. The implementation of tobacco-free policies leads to quick decreases in tobacco use, rates of cardiovascular disease, and hospitalizations from myocardial infarction.

Improving diet and physical activity can prevent type 2 diabetes among those at high risk in a very short space of time. In China, Finland and the USA, for example, study participants have significantly improved their diet and/or physical activity, and shown improved levels of blood pressure, blood glucose, cholesterol and triglycerides as quickly as one year after starting a programme, with improvements continuing for at least six years. The incidence of diabetes was reduced by almost 60% in both Finland and the USA, and by over 30% in China (1–3).

Lowering a person's serum cholesterol concentration results in quick and substantial protection from heart disease. Benefits are related to age: a 10% reduction in serum cholesterol in men aged 40 can result in a 50% reduction in heart disease, while at age 70 there is on average a 20% reduction. Benefits can be realized quickly – after two years – with full benefits coming after five years (4).



MILTON PAULO FLORET FRANZOLIN volunteers for the Juvenile Diabetes Association, which organizes fitness activities for children with diabetes. [PAGE 94](#)

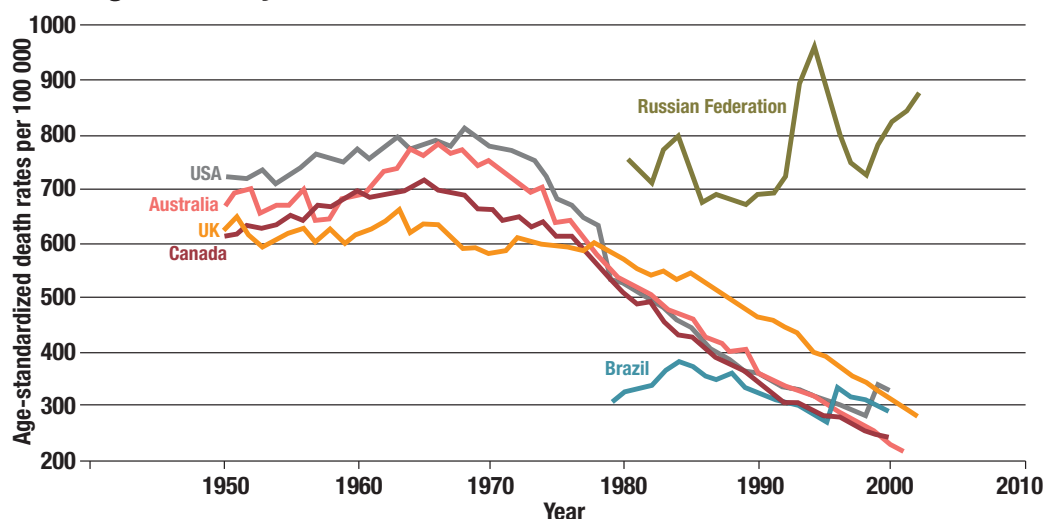


REGIONAL AND NATIONAL SUCCESS STORIES

Death rates from the major chronic diseases, especially cardiovascular diseases, have decreased dramatically over the past three decades in several countries in which effective programmes have been introduced, but have increased in countries where no such programmes exist. While Australia, Canada, the United Kingdom and the United States, for example, have achieved steady declines in heart disease death rates, the rates in other countries, such as Brazil and the Russian Federation, have remained the same or increased (see figure below).

How were these dramatic results achieved? Initial reductions occurred partly as a result of the diffusion of health-related information to the general population. Later, integrated and comprehensive approaches were successfully implemented. These approaches have been used to reduce chronic disease death rates in many countries, demonstrating the feasibility of achieving more widespread success.

Heart disease death rates among men aged 30 years and over, 1950–2002



A DRAMATIC REDUCTION IN THE DEATH RATE IN POLAND

Between 1960 and 1990, Poland experienced a serious increase in death rates from heart disease among young and middle-aged men and women. Unexpectedly, beginning with political and economic changes in 1991, this trend sharply reversed. In people aged between 20 and 44 years, the decline in death rates averaged 10% annually, while in those aged between 45 and 64 years, the annual rate of decline was 6.7%. This was one of the most dramatic rates of decline ever seen in Europe, although similar declines have since occurred in other countries in eastern Europe.

Poland's results have been attributed principally to the replacement of dietary saturated fat with polyunsaturated fat. Vegetable fat and oil consumption increased (primarily in the form of rapeseed and soybean oil products), while animal fat consumption, mainly butter, declined. These trends were associated with the removal of price subsidies on butter and the availability of cheaper vegetable oils. Other factors contributing to the decline include increased fruit consumption and decreased tobacco use (but only in men). Improvements in medical treatment contributed little, if at all, to the decline in death rates (5, 6).

ELIMINATING TRACHOMA IN MOROCCO

Morocco is on track to achieve the elimination of blinding trachoma by 2006. This success has resulted from a combination of high-level political commitment, partnerships and community participation in prevention and control efforts.

Trachoma is a chronic disease with an infectious origin that results in irreversible blindness if untreated. It was common in Morocco in the 1970s and 1980s. A national assessment in the early 1990s found that despite existing activities, the disease was still blinding the poor citizens of five

provinces who were not yet benefiting from the development of services and infrastructure seen elsewhere. An integrated programme backed by the King of Morocco and Ministry of Health officials was implemented with external partners. The programme included provision of surgical services to stop the progression of blindness, health promotion and environmental measures to prevent infection, and treatment with antibiotics in trachoma-endemic areas.

As a result, in the last 10 years more than 80 000 people have had progression of blindness prevented through surgery; more than 700 000 people were treated with antibiotics; over 40 000 sessions per year were organized to educate communities about primary prevention; some 8000 women per year received literacy education; and more than 80% of rural villages gained access to water points (from 14% in 1990).

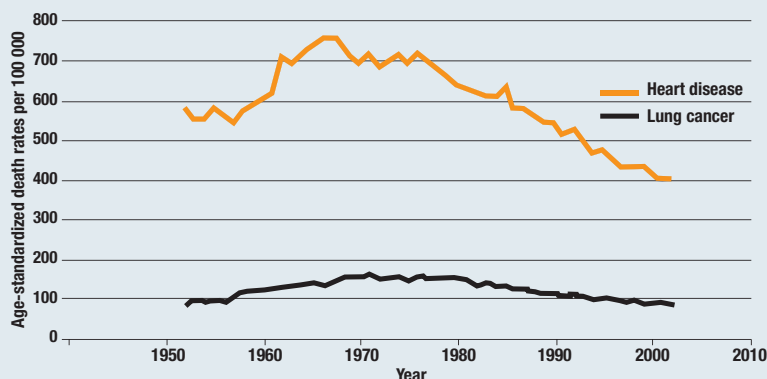
In rural disease-endemic areas, trachoma elimination has also been the entry point for introducing a surveillance system, which is now used for chronic diseases generally, developing the primary health care system, and enhancing eye and other health care interventions. Trachoma surgery is integrated with cataract services and dental care. Villages have also received support for the development of income-generating activities, with some of the revenue supporting health promotion and health service provision for children and the elderly.

REDUCING DEATH RATES FROM HEART DISEASE IN FINLAND

In the 1970s, Finland had the world's highest death rate from cardiovascular disease. This was largely a result of widespread and heavy tobacco use, high-fat diet and low vegetable intake. In response to local concerns, a large-scale community-based intervention was organized, involving consumers, schools, and social and health services. It included legislation banning tobacco advertising, the introduction of low-fat dairy and vegetable oil products, changes in farmers' payment schemes (linking payment for milk to protein rather than fat content), and incentives for communities achieving the greatest cholesterol reduction.

Death rates from heart disease in men have been reduced by at least 65%, and lung cancer death rates in men have also fallen. Greatly reduced cardiovascular and cancer mortality has led to greater life expectancy – approximately seven years for men and six years for women (7).

Heart disease and lung cancer death rates among men aged 30 years and over in Finland



face to face WITH **CHRONIC DISEASE:**

MILTON PAULO FLORET FRANZOLIN

“I’M A FIGHTER,



Risk factor reduction can lead to rapid health gains for both individuals and communities.

NOT A VICTIM”



BRAZIL

Name	Milton Franzolin
Age	52
Country	Brazil
Diagnosis	Diabetes

MILTON PAULO FLORET FRANZOLIN

has always been a sportsman.

He trains for marathons and

plays squash twice a week. In 2003, at the age of 50, he was diagnosed with diabetes following his yearly medical check-up. “At first I was revolted and didn’t understand how I’d become ill,” he says. “My frustration didn’t last for long, I didn’t want to be a victim but rather, a fighter.”



Ironically, Milton had been working as a volunteer with the Juvenile Diabetes Association of São Paulo for two years before being diagnosed with the disease. He had been developing a programme which

enables children with diabetes to exercise safely. “My goal is to prove that you can live a normal life and be physically competitive even if you have diabetes,” he explains.

More than ever, Milton is convinced that awareness is crucial to maintaining health and avoiding complications. “Treatment for diabetes may have improved lately but it is still difficult for poorer people living with the disease to have access to the information they need,” he says.

Milton now believes that being diagnosed with diabetes is the best thing that ever happened to him as he feels deeply that he’s making a difference through his actions. “It is a privilege and great feeling to be able to influence people’s lives, especially those of youngsters,” he adds. He encourages others to do the same.



2 Review of effective interventions

Comprehensive and integrated action is the means to prevent and control chronic diseases. This chapter describes and gives examples of the types of interventions, for the whole population or for individuals, that will enable countries to achieve major reductions in premature chronic disease deaths. The chapter outlines the evidence showing that chronic diseases can be prevented and controlled using available knowledge. Moreover, it shows that the solutions are not only effective but can be highly cost-effective even in settings with few resources.

- » A small shift in the average population levels of several risk factors can lead to a large reduction of the burden of chronic diseases
- » Population-wide approaches form the central strategy for preventing chronic disease epidemics, but should be combined with interventions for individuals
- » Many interventions are not only effective but are also suitable for resource-constrained settings

LAWS AND REGULATIONS

National and local legislation, regulations, ordinances, international laws and treaties and other legal frameworks are fundamental elements of effective public health policy and practice. Historically, laws have played a crucial role in some of the greatest achievements in public health such as environmental control laws, seat-belt laws, warnings on cigarette packs and other tobacco control measures, and water fluoridation to reduce dental caries.

Current laws relating to chronic disease have proved to be an effective and central component of comprehensive prevention and control strategies. Advertising bans for tobacco products and the reduction of salt in food (whether through voluntary agreement with industry or enforced) are both very cost-effective in all regions, as assessed by the WHO-CHOICE project.¹

MORE COULD BE DONE

Legal frameworks have been used extensively with regard to tobacco control, although the WHO Framework Convention on Tobacco Control is the only global framework. Legislation and regulations could be used more effectively to reduce the burden of chronic disease, and to protect the rights of people with a chronic disease.

¹ The WHO-CHOICE project analyses the health effects and costs of interventions (see Annex 5). Interventions are grouped into three broad categories: very cost-effective, cost-effective or cost-ineffective. Results presented in this publication represent a sub-set of all the interventions that were studied by the WHO-CHOICE project, and were selected based on their relevance to chronic disease prevention and control, as well as their cost-effectiveness.

SPOTLIGHT TOBACCO CONTROL IN THE PHILIPPINES

In 1999, the Philippines introduced major changes in tobacco control policies which have contributed to positive changes.

The Philippines Clear Air Act of 1999 identified cigarette smoke as a pollutant and instituted smoke-free indoor air laws. The national law allows designated smoking areas in restaurants and other indoor areas, but some cities have declared all indoor areas to be completely smoke-free. Taxes on cigarettes have also been increased.

The Youth Smoking Cessation Programme in 2003 declared campuses to be smoke-free, improved training for students and teachers, and levied penalties for smoking.

The Tobacco Regulatory Act of 2003 seeks to increase public education measures, ban all tobacco advertising, strengthen warning labels on tobacco products, and prohibit sales to minors.

All programmes have received extensive national and local media coverage. Evidence of the success of this legislation in combination with other interventions can be seen in the significant drop in the number of students who reported being current cigarette smokers or using other tobacco products over the period 2000–2003. The percentage of students who had never smoked but were likely to initiate smoking in the next year also decreased, from 27% in 2000 to 14% in 2003. Among adolescent boys, the percentage of current tobacco smokers declined by around a third, from 33% in 2000 to 22% in 2003. Among adolescent girls, the decline was similar, from 13% in 2000 to 9% in 2003 (8).

SPOTLIGHT TOBACCO CONTROL IN SINGAPORE

The legislative measures that have been implemented in Singapore to control tobacco use include:

- » prohibition of tobacco advertising and promotion;
- » restrictions on the sale of tobacco products;
- » licensing of sales outlets;
- » use of health warnings on cigarette packs;
- » restrictions on smoking in public places;
- » prohibition of smoking in public by people under the age of 18 years.

Singapore's smoking rate decreased from an overall prevalence rate of 23% in 1977 to 20% in 1984, and to the lowest level ever, 14%, in 1987. However, smoking rates went up to 17% in 1991 and as high as 18% in 1992. This increase stimulated a review of the situation and of the measures in place. Consolidation of the Smoking (Control of Advertisements and Sale of Tobacco) Act in 1993 led to new sections being added. This, together with the 1994 amendments to health warnings to make them more conspicuous and bold, extension of the prohibition of smoking to all air-conditioned offices, and continuing education programmes and progressive increases in taxation, contributed to a second drop in rates, to 17% in 1995 and 15% in 1998 (9).

TAX AND PRICE INTERVENTIONS

Taxation is one policy instrument for reducing the use of tobacco and intake of foods that are high in fat, sugar and salt. Alternatively, subsidies can be used to promote healthy choices or reduce the cost of goods and services that promote physical activity.

Taxation policies can contribute effectively to the reduction of tobacco use and raise revenue for health promotion and disease prevention programmes, as shown in the Australian state of Victoria and subsequently in several other countries, including Thailand.

Price increases encourage people to stop using tobacco products, they prevent others from starting, and they reduce the number of ex-tobacco users who resume the habit. A 10% price increase in tobacco products has been shown to reduce demand by 3–5% in high income countries, and by 8% in low and middle income countries. Young people and the poor are the most responsive to price changes. Taxation of tobacco products is also very cost-effective (as assessed by the WHO-CHOICE project).

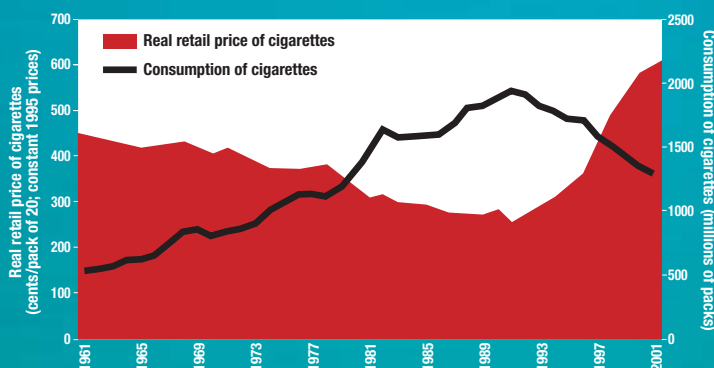
Prices affect food choices and consumption patterns, and food and drink taxes also have the potential to generate revenue which can be earmarked for diet, activity and obesity-prevention initiatives.

In some countries, higher prices have been shown to reduce consumption of soft drinks. In Zambia, for example, sales of branded soft drinks dropped dramatically after prices rose. Alternatively, subsidies can encourage healthier food choices. Studies have shown, for example, that price subsidies in schools and in workplaces increase fruit and vegetable consumption.

SPOTLIGHT TOBACCO TAXATION IN SOUTH AFRICA

In 1994, the Government of South Africa announced that it would increase the tax on tobacco products to 50% of the retail price. This action has contributed to a doubling of the price of tobacco products over the past decade. Along with other tobacco control interventions, tax increases have contributed to a 33% reduction in tobacco use (see figure below). In addition, government revenue from tobacco taxes has more than doubled (10).

Cigarette consumption and real prices of cigarettes in South Africa, 1961–2001



IMPROVING THE BUILT ENVIRONMENT

There are a growing number of examples to show that changing the built environment can lead to increased physical activity. Providing access to exercise facilities, walking and cycle ways, along with compact urban planning, increase the opportunities for, and reduce barriers to, physical activity.

In the Americas, rates of walking and cycling in older neighbourhoods with high population densities, mixed land use, and well-constructed inter-connecting footpaths are 30–50% higher than in low-density neighbourhoods typical of suburban sprawl (11).

The use of stairs instead of lifts or escalators in public places can be increased by means of signs, posters and music, although the effects are relatively small and short term (12).

ADVOCACY

Advocacy interventions use information in deliberate and strategic ways to change decision-makers' perceptions or understanding of an issue and to influence decision-making. They can also shape public perceptions and behaviour and build popular support for policy-making.

A vast array of communication methods is available, the choice depending on the desired outcome. Communication methods range from one-to-one conversations to mass media campaigns and often work better together than individually. They must be selected for their ability to deliver the message effectively and should be tailored to the specific advocacy objective. Common communication methods include information campaigns, publications and web sites, press releases, lobbying and peer-to-peer communication. Health education on cardiovascular risk factors via broadcast and print media has been shown to be very cost-effective in all regions by the WHO-CHOICE project.

SPOTLIGHT

IMPROVING THE BUILT ENVIRONMENT IN COLOMBIA

Over the past 10 years, the city of Bogotá, Colombia, with almost 8 million inhabitants, has made significant progress in promoting physical activity. Safe spaces specifically set aside for leisure activities are now provided, including 128 km of streets exclusively for recreational and sports activities on Sundays and holidays. The city also provides parks, public aerobics classes, a 300 km network of bike paths and a large network of pedestrian-ways. Policies limiting the use of private cars have also been implemented (13).

SPOTLIGHT

ADVOCATING FOR PHYSICAL ACTIVITY IN BRAZIL

The Agita São Paulo programme promotes physical activity among the 37 million inhabitants of the state of São Paulo, Brazil. The programme, launched in 1996, organizes “mega-events” such as the Agita Galera Day. In addition to such large-scale events, the programme has over 300 partner institutions, whose main mission is to disseminate the message through their own networks.

Direct costs of the programme are covered largely by the São Paulo State Health Secretariat, with a budget of roughly US\$ 150 000, representing an investment of less than US\$ 0.5 per inhabitant per year.

Surveys of representative samples of the São Paulo population show that the prevalence of respondents engaging in regular physical activity rose from 55% in 1999 to 60% in 2003. Targeted subgroups showed much more dramatic improvements. For example, of a group of people with high blood pressure and diabetes who received education sessions and personalized advice, there was a reported 96% increase in those who participated in regular physical activity (14).

COMMUNITY-BASED INTERVENTIONS

Community-based programmes for chronic disease prevention and control target a specified community. They focus on risk factor reduction, community mobilization and participation.

Integrated community-based programmes aim to reach the general population as well as targeting high-risk and priority populations in schools, workplaces, recreation areas, and religious and health-care settings. They also enable communities to become active participants in decisions concerning their health, and promote simultaneous use of community resources and health services, as well as coordinating different activities by means of partnerships and coalitions.

Successful community-based interventions require partnerships between community organizations, policy-makers, businesses, health providers and community residents. Such interventions for chronic diseases in developed countries have demonstrated considerable potential for effectiveness in developing countries.

Community-based interventions can also be the starting point for national improvement. Finland, featured earlier in this part, is a good example of how community-based programmes, once shown to be successful, can be scaled up to national level (15).

SCHOOL-BASED INTERVENTIONS

School health programmes can be an efficient way of reducing risks among large numbers of children. They vary from one country to another, but almost all include four basic components: health policies, health education, supportive environments and health services. Such programmes often include physical education, nutrition and food services, health promotion for school personnel and outreach to the community.

Many school health programmes focus on preventing the risk factors associated with leading causes of death, disease and disability, such as tobacco, drug and alcohol use, dietary practices, sexual behaviour and physical inactivity.

In comparative studies of public health interventions, the World Bank concluded that school health programmes are highly cost-effective. The annual cost of school health programmes was estimated to be US\$ 0.03 per capita in low income countries and US\$ 0.06 in middle income countries, respectively, averting 0.1% and 0.4% of the disease burden (16).

SPOTLIGHT COMMUNITY-BASED PROJECTS IN CHINA

There have been several major community-based projects in China relating to chronic diseases. In China's third largest city, Tianjin, for example, a project was launched in 1984 aimed at reducing chronic disease risk factors at the community level. Activities included training health personnel, health education, health counselling and environmental changes. The nutrition project was integrated into the existing three-level health-care structure in the Tianjin project area without allocation of additional resources. Health workers were trained to increase their knowledge about the relationship between salt intake and blood pressure, and were taught how to give practical advice to patients on this issue.

The project also introduced environmental changes to promote healthy eating habits. Leaflets were distributed door-to-door, and posters and stickers were distributed to food retailers. Special measuring spoons were provided. Low sodium salt was also introduced, and the project cooperated with salt manufacturers and shops to ensure that this salt was available in the intervention area.

An outcome of the study was that residents in the intervention area had significantly better knowledge about salt intake than residents in an area not taking part. In the intervention area, average salt intake was significantly lower in men, and also reduced in women. In addition, there was a significant decrease in systolic blood pressure in the intervention area for both men and women. In contrast, both salt intake and systolic blood pressure increased significantly during the same period in men who did not take part.

In 1995, after comprehensive reviews by the Ministry of Health, Foreign Loan Office and the World Bank, a new project – the World Bank Loan Health VII: China Disease Prevention Project – was undertaken in seven cities, as well as some regions of Yunnan Province, covering a population of 90 million. It included activities in four fields: institutional development and policy reform, human resource development, surveillance and community intervention. Among the outcomes reported was a reduction in the prevalence of male adult cigarette smokers from 59% to 44%. In Beijing there were substantial increases in high blood pressure detection and treatment, and a fall in the death rates for both stroke and heart disease of more than 15% in the last year of the project.

Based on this experience, the Ministry of Health has established a total of 32 demonstration sites for chronic disease prevention and control across the country. Detailed interventions are determined and implemented by local health departments, according to local conditions. Notable outcomes so far have included a reduction in the annual heart disease and stroke deaths in those patients with high blood pressure who were being managed, from 1.6% to 0.8% between 2000 and 2002. In Shenyang, there was a reduction in the prevalence of adult smokers from 29% to 13% between 1997 and 2002 and an increase in the proportion of people participating in planned regular physical activity from 41% to 84% in the same period (17).

SPOTLIGHT SCHOOL-BASED PROGRAMMES IN THE UNITED STATES

The Child and Adolescent Trial for Cardiovascular Health (CATCH) is the largest school-based health study to have been conducted in the United States. It was designed to decrease cardiovascular risk factors in children through:

- » modifications to food services to reduce fat consumption;
- » smoke-free school policies;
- » school health education on cardiovascular risks;
- » a complementary family component to educate parents about cardiovascular risks;
- » physical education to increase the frequency and intensity of physical activity.

Results demonstrated that children from the intervention schools had lower consumption of total fat and saturated fat, and higher levels of self-reported physical activity, than those from comparison schools. Furthermore, intervention children maintained their results for three years without further interventions.

After five years of follow-up and no further intervention:

- » menus from 50% of the former intervention cafeterias met the Eat Smart guidelines for fat compared with 10% of the former control schools;
- » student energy expenditure levels and proportion of time spent in moderate-to-vigorous physical activity in the intervention schools had been maintained, although vigorous activity had declined.

These results suggest that changes in the school environment to support health can be maintained over time. Staff training is an important factor in institutionalizing such programmes (18).

VENDING MACHINES

Several interesting school studies have illustrated the ways in which vending machines can be used to promote a healthy diet. A study in the United Kingdom by the Health Education Trust, for example, found that when drink options were increased in school vending machines, even alongside regular options, children chose to drink milk, fruit juices and water. Involving students in decisions related to vending machine choices and the maintenance and location of the machines was important to success (19, 20).

Venice High School in Los Angeles, USA, began offering a variety of waters, 100% juices and soy milk as well as cereal bars to replace the snacks which had previously been sold. After one year, snack sales in the student store were up by over US\$ 1000 per month compared with the previous year. Two years after the changes, snack sales per month had roughly doubled (21).

WORKPLACE INTERVENTIONS

Workplace interventions for chronic disease prevention and control are a feasible and often successful means of improving the health of employed adults. Interventions tend to focus on chronic diseases and risk factors that substantially inhibit productivity and incur the most serious health and economic burdens.

Workplace interventions can lead to large gains, both in the short and long term, for employees and employers. Improvements can be seen in worker productivity, reduced levels of absenteeism, and employer cost-saving. These interventions have the added benefit of creating a workplace environment that is health-conscious, providing for easier follow-up with participants.

Programmes that address multiple risk factors for chronic diseases are more successful and improve participation. These programmes allow employees to decide what risk factors they want to improve and define their own goals (22).

Financial rewards, work-related incentives (counting programme time as part of core work hours, for example), discounts on fitness activities, or even simply providing programmes free of charge can increase participation in and adherence to workplace interventions. A comprehensive approach including both policies and programmes, rather than either in isolation, increases the likelihood that employees will participate.

The most effective workplace tobacco control strategies have used comprehensive approaches, implementing tobacco bans as well as focusing on those at high risk (23).

SCREENING

Screening is the systematic application of a test to identify individuals at risk of a specific disease. The goal is for people who have not sought medical attention to benefit from further investigation or direct preventive action. Effectively implemented medical screening can prevent disability and death and improve quality of life. Screening tests are available for some chronic diseases, including cardiovascular disease, diabetes, and several site-specific cancers (24).

The disease or disorder to be considered for screening must be well defined, of public health importance and of known prevalence in the population. An effective, affordable and acceptable treatment must be available to all those who require it (25).

In general, the number of proven screening procedures is limited, although notable exceptions include the following:

- » screening for elevated risk of cardiovascular disease using an overall risk approach;
- » screening for early detection of breast and cervical cancer, in countries with sufficient resources to provide appropriate treatment.

SPOTLIGHT WORKPLACE HEALTH IN THE UNITED STATES

Johnson & Johnson's Health & Wellness Program seeks to reduce behavioural and psychosocial risk factors, increase healthy behaviours, detect disease early, and manage chronic diseases. The programme provides preventive services as well as services during and after a major medical event.

After almost three years, improvement was seen in eight out of 13 risk categories for employees. Risk reductions were significant for tobacco use, aerobic exercise, high blood pressure, high cholesterol, dietary fibre intake, seat-belt use, and drinking and driving habits. The programme also resulted in financial benefits to Johnson & Johnson in the amount of money saved per employee per year on medical expenses. These savings increased substantially after the second year (26, 27).

SPOTLIGHT CERVICAL CANCER SCREENING IN COSTA RICA

Cervical cancer remains a major health problem, particularly in low and middle income countries. Yet it can be prevented and cured if detected early. Effective screening programmes for cervical cancer in low and middle income countries can help reduce cervical cancer incidence and mortality. For example, in a number of Latin American countries, cervical cytology screening programmes have been in place for more than three decades and show some positive results.

In Costa Rica, cytology screening has been available to women aged 15 years and older since 1970. Some 250 000 smears are carried out every year, and more than 85% of eligible women have been screened at least once. However, nationwide coverage varies greatly and coverage of rural areas is still inadequate. Although the incidence of cervical cancer remained stable from 1983 to 1991, it declined significantly more recently, with a 3.6% decrease in annual incidence in 1993–1997 as compared with 1988–1992 (28).

CLINICAL PREVENTION

Clinical prevention is designed either to reduce the risk of disease onset or to reduce complications of disease in people living with disease. There are a number of highly effective clinical interventions that, when properly delivered, can reduce death and disease and improve the quality of life of people at risk of, or living with, chronic diseases. These include supporting behaviour change, the use of pharmacological agents and surgery. One example – combination drug therapy (aspirin, beta blocker, diuretic, statin) for people with an estimated overall risk of a cardiovascular event above 5% over the next 10 years – was shown to be very cost-effective in all regions by the WHO-CHOICE project.

SUCCESS FACTORS

A combination of interventions is required to realize the full potential of risk reduction.

- » Treatment approaches based on overall risk, which take into account several risk factors at once, are more cost-effective than those based on arbitrary cut-off levels of individual risk factors.
- » For some diseases (such as cataract) single, highly cost-effective interventions are available.

REDUCING THE RISKS OF DISEASE ONSET

Clinical interventions are a key component of comprehensive programmes for reducing the likelihood of disease onset. Individuals are at highest risk when they have several risk factors or when they have established disease. To reduce the likelihood of disease onset among high-risk individuals, screening and treatment need to be based on an assessment of overall risk (as determined by multiple rather than single risk factors).

A FOCUS ON OVERALL RISK

Overall risk refers to the probability of disease onset over a specified time period. Cut points for defining individuals at high risk and requiring clinical intervention need to be based on consideration of the desires of informed patients, the availability of cost-effective interventions and the risks and benefits of interventions, as well as their cost. Ideally, the assessment of future risk should be based on locally relevant data; unfortunately this is not usually available and risks are often assessed on the basis of data from other populations (29).

The overall risk of new cardiovascular disease events can be estimated by taking into account several risk factors. The charts on the following pages make it simple to calculate a person's risk. These charts estimate the risk of a cardiovascular event per 100 people over the next five years among people without previous symptomatic cardiovascular disease. They are used by identifying the category relating to a person's sex, diabetic status, tobacco-use history and age (30).

INTERVENTIONS FOR HIGH-RISK INDIVIDUALS

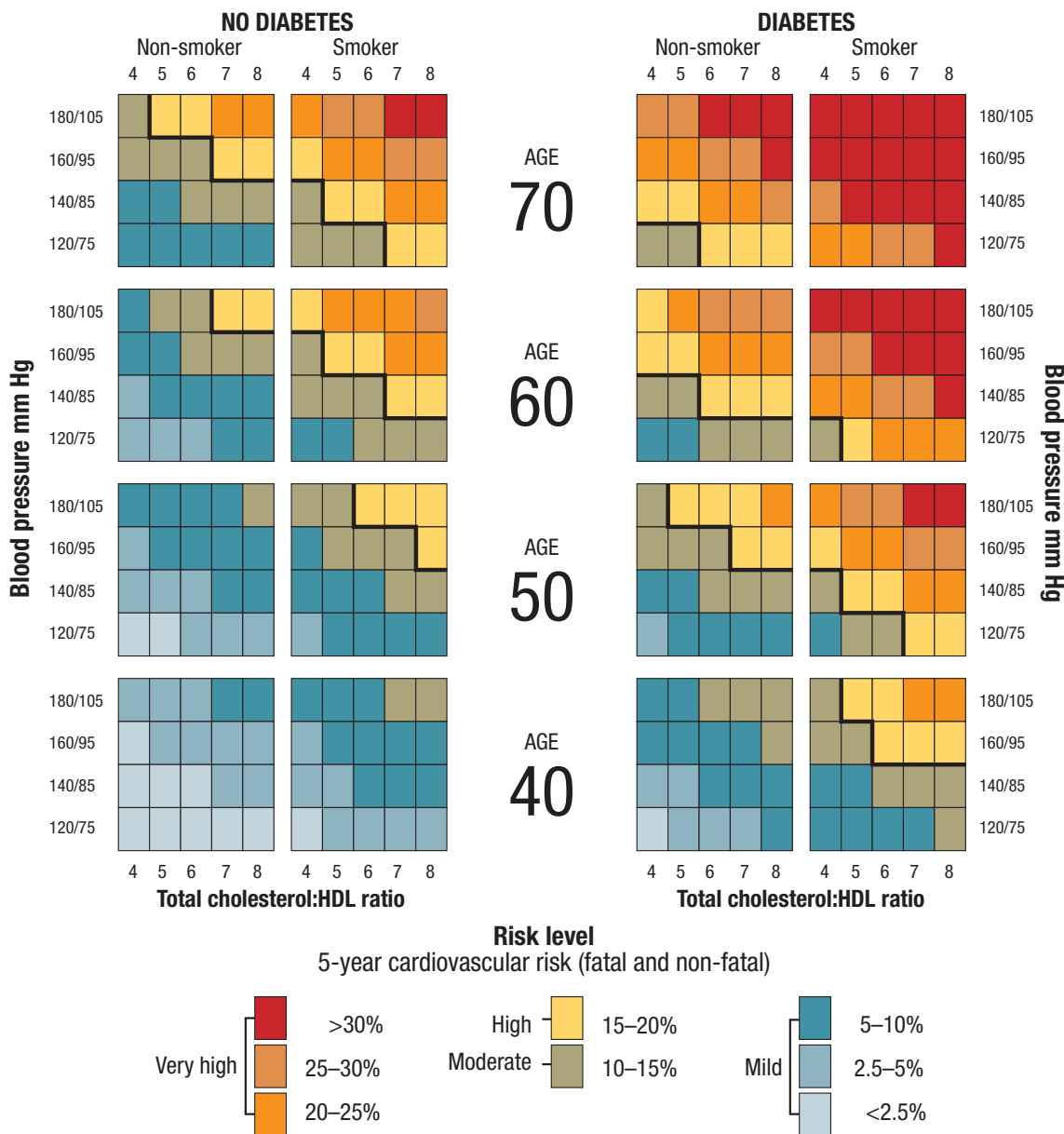
There are several highly effective clinical interventions appropriate for individuals at high risk. The benefits of the intervention must, however, clearly outweigh any danger, such as unwanted pharmacological effects. Interventions should be evidence-based, and they should also consider local needs and resource constraints. Sufficient resources must be available to provide the intervention to all those identified as in need.

REDUCING THE RISKS IN ESTABLISHED DISEASE

For cardiovascular disease and diabetes in particular, evidence-based approaches to reducing the risk of adverse outcomes in people with the disease are very similar to the approaches used to reduce disease onset. The major difference is that the likelihood of future clinical events is much greater once disease is established.

New Zealand cardiovascular risk charts

Risk level: women

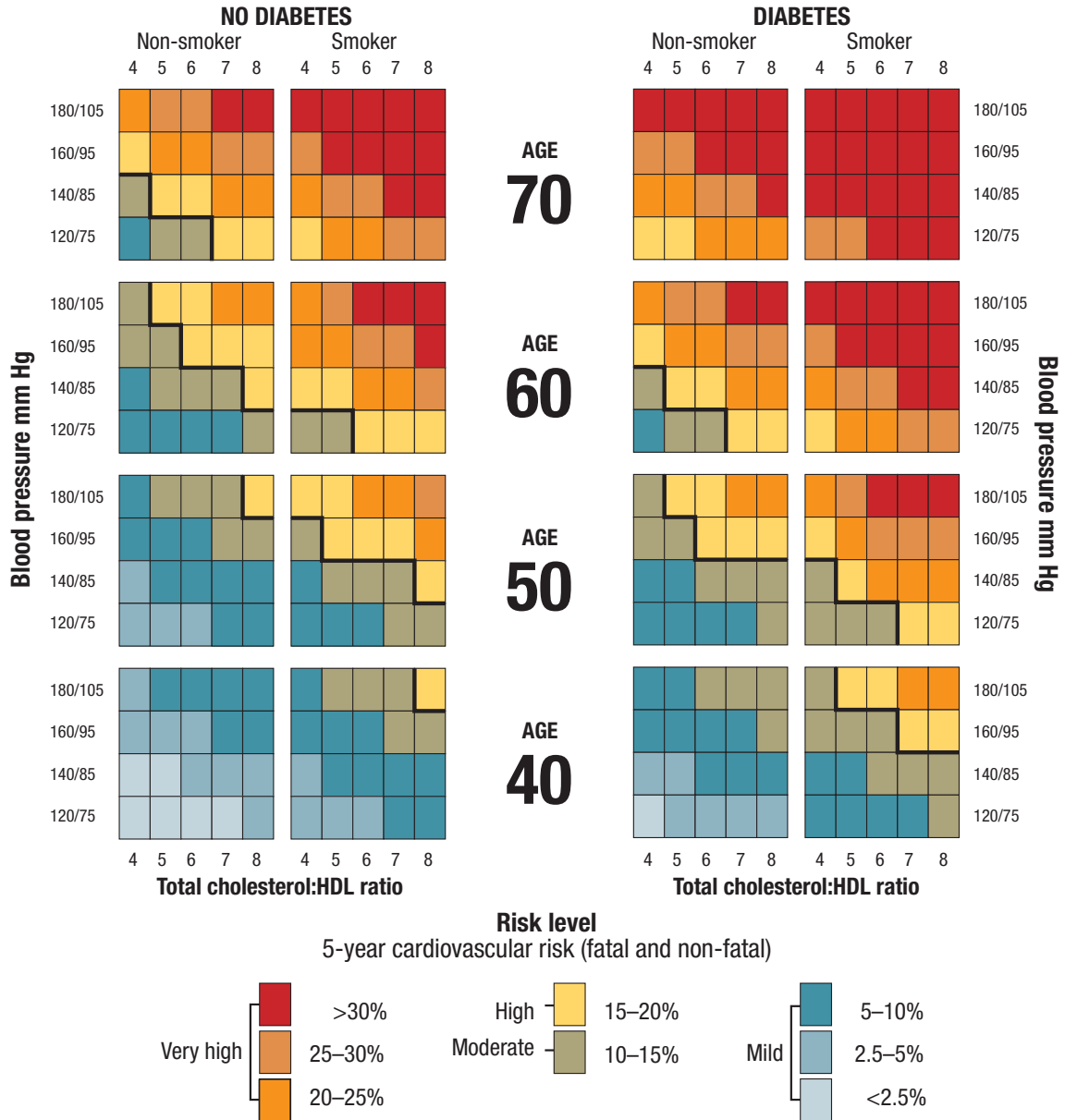


How to use the charts

- Identify the chart relating to the person's sex, diabetic status, smoking history and age.
- Within the chart choose the cell nearest to the person's age, blood pressure and total cholesterol:HDL ratio. When the systolic and diastolic values fall in different risk levels, the higher category applies.
- For example, the lower left cell contains all non-smokers without diabetes who are less than 45 years old and have a total cholesterol:HDL ratio less than 4.5 and a blood pressure less than 130/80 mm Hg. People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.

New Zealand cardiovascular risk charts

Risk level: men



How to use the charts

- Identify the chart relating to the person's sex, diabetic status, smoking history and age.
- Within the chart choose the cell nearest to the person's age, blood pressure and total cholesterol:HDL ratio. When the systolic and diastolic values fall in different risk levels, the higher category applies.
- For example, the lower left cell contains all non-smokers without diabetes who are less than 45 years old and have a total cholesterol:HDL ratio less than 4.5 and a blood pressure less than 130/80 mm Hg. People who fall exactly on a threshold between cells are placed in the cell indicating higher risk.

Highly effective interventions exist for reducing the risk of cardiovascular events in patients with diabetes and/or established cardiovascular disease. They include the following:

» Behavioural interventions: including those for tobacco cessation, increased physical activity and dietary change, with the promotion of weight loss if appropriate. Together, these may achieve a risk reduction of over 60% in people with established heart disease, and are also a key part of achieving good blood glucose control in people with diabetes (31).

» Pharmacological interventions: including aspirin, beta-blockers, angiotensin converting enzyme inhibitors and statins. A combination of all four of these is expected to reduce the risk of recurrent myocardial infarction by 75%.

People with established cardiovascular disease are at the highest risk of cardiovascular death and account for half of all cardiovascular deaths. For these people, international guidelines recommend long-term antiplatelet, blood pressure lowering and cholesterol lowering therapies. However, treatment gaps are substantial in all countries, in part because of the cost and complexity of multiple drug use.

POTENTIAL OF FIXED DOSE COMBINATION THERAPY

One strategy that has been proposed to reduce these barriers is a fixed dose combination pill (now commonly known as a *polypill*). Because each component apparently works in addition to the others, net benefits are anticipated to be substantial – risk reduction of more than two thirds within a few years of treatment – although more research is

SPOTLIGHT TOBACCO CESSATION SERVICES IN THE UNITED KINGDOM

The United Kingdom's National Health Service (NHS) Stop Smoking Services were set up in 1999 in Health Action Zones, which were established in areas of deprivation and poor health in order to help tackle health inequalities. Following successful implementation in these areas, the services were made available across England to all smokers. Smokers set a date with the help of their adviser, and are then supported through the first stages of their attempt to stop smoking and followed-up after four weeks. A large increase in funding was made available and a demanding national target was set: 800 000 smokers to have stopped at the four-week follow-up stage by March 2006. It is planned that an electronic appointments system will be available to smokers to book appointments with the NHS Stop Smoking Services. This is supported by a tobacco control strategy including the media (in an education and information role), strengthening of regional and local action, reducing supply and availability, reducing tobacco promotion, and reducing exposure to second-hand smoke.

Results for the period April 2004–March 2005 show that around 300 000 smokers had successfully stopped at the four-week follow-up stage compared with about 205 000 the year before (an increase of 45%). Initial findings also show that equity of access to treatment is good, although success rates are lower among disadvantaged groups.

needed. Fixed dose combinations are now a core component of care for people with HIV/AIDS, tuberculosis and malaria. As well as improving clinical outcomes, they simplify distribution of multiple medications, which can be an important advantage in a resource-limited health-care setting.

The major challenge remains one of implementation – new strategies are required for the many millions of under-treated individuals with established cardiovascular disease in low and middle income countries. Ideally, these strategies should integrate with systems for other long-term medication delivery, such as those for HIV/AIDS, and complement population-wide measures to address the causes of cardiovascular disease.

The components of a polypill are no longer covered by patent restrictions and could be produced at a cost of little more than US\$ 1 per patient per month. For people with cardiovascular disease in low and middle income countries, access to preventive care is usually dependent upon their ability to pay, and hence it is this large, underserved group that stands to gain most from a polypill (32, 33).

DISEASE MANAGEMENT

The previous sections of this chapter have shown that there are highly effective and cost-effective interventions to reduce the morbidity and mortality attributable to chronic diseases. Yet in many places, effective interventions for chronic diseases are poorly delivered or are not available at all.

Specific reasons for poor or absent delivery of chronic disease interventions vary between countries and between regions within countries. In some settings, lack of human, physical and financial resources are the major constraining factors. In other settings, resources are available but are used in a fragmented and inefficient manner. Factors to take into account include the following:

- » evidence-based decision support tools can improve the delivery of effective care for chronic diseases;
- » effective clinical information systems, including patient registries, are an essential tool for providing the continuity of care necessary for chronic diseases;

SPOTLIGHT CHRONIC DISEASE MANAGEMENT IN SOUTH AFRICA

In a rural South African setting, a nurse-led chronic disease management programme for high blood pressure, diabetes, asthma, and epilepsy was established as part of primary health care for a population of around 200 000 people. The programme included the introduction of: clinic-held treatment cards and registries; diagnostic and management protocols; self-management support services; and regular, planned follow-up with a clinic nurse.

Nurses were able to improve disease control among most of the patients: 68% of patients with high blood pressure, 82% of those with diabetes, and 84% of those with asthma (34).

SPOTLIGHT

HEALTH-CARE QUALITY IMPROVEMENT IN THE RUSSIAN FEDERATION

Tula is an industrial town in the Russian Federation in which cardiovascular disease is a leading cause of death, accounting for 55% of adult mortality. High blood pressure prevalence is estimated at 27% and is considered to be a primary contributor to this mortality rate.

In 1998 the Central Public Health Research Institute of the Russian Ministry of Health and the Tula Oblast Health Authority, together with international partners, began an attempt to improve care for patients with high blood pressure. Five health-care facilities, each with a multidisciplinary team of staff, were involved in the decision-making and planning of the project. Goals included:

- » developing evidence-based guidelines for high blood pressure care at the primary care level;
- » changing the delivery of care for high blood pressure to reflect the new guidelines;
- » promoting healthy behaviours to prevent the complications of high blood pressure;
- » reallocation of financial and human resources to facilitate implementation of these services.

Positive outcomes included a sevenfold increase in the number of patients managed at primary care level. There was a 70% success rate in controlling high blood pressure, an 85% reduction in admissions for high blood pressure, and net savings for overall high blood pressure care costs of 23%. Other recent results from Russia, however, have not been so impressive (35).

The quality improvement project was expanded during Phase II (2000–2002) to all 289 general practitioner practices covering the whole population of the Tula region, and Phase III (national scale up) for integrated chronic disease prevention and control was launched in December 2002 (36).

- » the provision of multidisciplinary health-care teams can be a highly effective approach to improving chronic disease care;
- » the support of patient self-management is a core element of effective chronic disease care.

RELEVANCE FOR HIV/AIDS

These factors are also applicable to HIV/AIDS care. Health specialists are increasingly viewing HIV/AIDS as a chronic condition that requires comprehensive health services similar to those needed for heart disease and diabetes. Countries can obtain greater efficiency from their health systems by combining disease management for all chronic conditions.

USE OF PATIENT INFORMATION SYSTEMS

Well-designed, locally relevant and sustainable clinical information systems are essential if the goal of coordinated long-term care is to be achieved. They enable the organization of patient information, tracking and planning of patient care, provision of support for patient self-management, and scheduling of patient follow-up.

Clinical information systems are effective when they encourage communication between clinical team members and patients. They can take a variety of forms, and effective systems can be created even in very resource-poor settings. They may be paper-based, such as a chronic disease register kept in a notebook, and be linked to patient records, computerized, or a combination of the two.

MULTIDISCIPLINARY HEALTH-CARE TEAMS

One of the characteristics of most chronic diseases is that the care required for them cuts across several different health-care disciplines. Multidisciplinary health-care teams, centred on primary health care, are an effective means in all settings of achieving this goal and of improving health-care outcomes (37).

WORKING SUCCESSFULLY IN RESOURCE-POOR SETTINGS

The long list of health-care disciplines that ideally should be available for individuals with chronic diseases may appear to be unrealistic in resource-poor settings. It is possible, however, to provide some of the core skills from these disciplines in other ways (by training primary health-care workers in key elements of chronic disease management, for example). It may be possible to provide core aspects of effective health care that in more resourced settings would be provided by health professionals from several different disciplines.

USE OF EVIDENCE-BASED DECISION SUPPORT TOOLS

The development and implementation of evidence-based treatment guidelines is fundamental to putting evidence into practice. Guidelines have been defined as “systematically developed statements (recommendations) to assist practitioner and patient decisions about appropriate health care for specific clinical circumstances” (38). They draw on the best research evidence available at the time. The production of an evidence-based guideline is a resource-intensive and time consuming process. Nonetheless, evidence-based guidelines are available for many chronic diseases (see, for example, <http://www.guideline.gov>), and guidance on adapting them to specific national or local circumstances has been described. Of course, guidelines only work if they are used appropriately (39, 40).

SUCCESS FACTORS

The evidence suggests that the more specific and focused the approach to implementation, the more likely that practice will change in the direction recommended by a guideline. For example, simply providing information about the guideline is likely to have little impact, but linking the guideline to workshops or outreach training sessions and providing prompts within medical records are much more likely to change practice (41).

SPOTLIGHT IMPROVING DIABETES CARE IN MEXICO

The Secretariat of Health of Mexico has launched a “crusade for the quality of health services” to provide better health care to people with chronic diseases. A one-year pilot project was conducted in the State of Veracruz, with in-service training of primary care personnel and the implementation of a structured diabetes education programme. Primary health-care teams were trained to adopt a quality improvement methodology. Among the innovations in primary health centres were the organization of diabetes clinics, collective medical visits for self-support groups of people with diabetes, and training people with diabetes to be community health workers.

The number of people with diabetes and good control increased from 28% to 39% in the intervention group, while among those receiving usual care the proportion only increased from 21% to 28%. Documented foot care education increased to 76% of patients in the intervention group and only to 34% elsewhere. The proportion of patients using insulin increased among the intervention group from 3.5% to 7.1%, while it remained at 0.9% among those receiving usual care (42).

SPOTLIGHT CHRONIC DISEASE SELF- MANAGEMENT IN CHINA

A chronic disease self-management programme was developed in Shanghai from 1999 to 2001. The programme was conducted by trained volunteer lay leaders and included exercise, the use of cognitive symptom-management techniques, nutrition, fatigue and sleep management, use of medications, management of fear, anger, and depression, communication with health professionals, problem-solving and decision-making.

The programme significantly improved participants' health behaviour, confidence and health status, and reduced the number of hospitalizations after six months. The programme has been implemented in 13 communities and six districts of Shanghai, and is being replicated in other cities (43).

SPOTLIGHT COMMUNITY-BASED REHABILITATION IN INDIA

In rural south India, permanently blind people were supported with community-based rehabilitation. This included mobility training and training to perform normal daily activities. Quality of life improved for some 95% of participants (44).

SPOTLIGHT COMMUNITY-BASED REHABILITATION IN PAKISTAN

In Pakistan, volunteer local supervisors from targeted communities (villages and slum areas) were taught to identify and train people with disabilities. One to two years after training, 80% of participants showed improvement in function (45).

SUPPORT FOR PATIENT SELF-MANAGEMENT

Self-management for people with chronic disease is now widely recognized as a necessary part of treatment. Interventions that aim to improve the ability of patients and their carers to manage conditions can be highly effective and are an essential component of chronic disease care (46).

REHABILITATION

Chronic diseases are major causes of disability, including blindness, lower limb amputation, motor and sensory dysfunction following stroke, chronic pain, and impaired functioning following myocardial infarction.

Rehabilitation is intended to enable people to continue to live full lives as part of society. In some conditions, notably after myocardial infarction, rehabilitation reduces mortality. Multidisciplinary and intensive rehabilitation programmes, common in high income countries, are typically not feasible in low and middle income countries. However, community-based rehabilitation can provide effective rehabilitation in these countries.

EVIDENCE OF EFFECTIVENESS

- » Rehabilitation services for patients following a stroke and living at home can improve independence (47).
- » Multidisciplinary rehabilitation services in patients with chronic low back pain can reduce pain and improve function (48).
- » Cardiac rehabilitation (following myocardial infarction), with a focus on exercise, is associated with a significant reduction in mortality (49–51).

PROVIDING REHABILITATION SERVICES IN DEVELOPING COUNTRIES

Rehabilitation services are usually provided by a team of specialized personnel, including medical doctors, dentists, prosthetists, physiotherapists, occupational therapists, social workers, psychologists, speech therapists, audiologists and mobility instructors. In many low and middle income countries, this rehabilitation approach is not feasible owing to shortages of health workers and other resource constraints.

In these situations, community-based rehabilitation is a viable alternative, using and building on the community's resources as well as those offered at district, provincial and central levels. Community-based rehabilitation is implemented through the combined efforts of people with disabilities, their families, organizations and communities, as well as the relevant governmental and nongovernmental health, education, vocational, social and other services. Such efforts are being made in more than 90 (mostly low and middle income) countries. The focus has expanded to health care, education, livelihood opportunities and participation/inclusion. As an overall approach, it has not been rigorously evaluated but site-specific evidence is generally positive.

PALLIATIVE CARE

Palliative care concentrates on the management of life-threatening chronic diseases and on supporting people so that they can achieve the best quality of life possible. Although typically associated with life-threatening cancer, it is often needed in other chronic conditions. Palliative care ranges from personal care and assistance in daily living to counselling and pain management. Palliative care is an urgent need worldwide. It is an integral part of long-term care, and even when there is no cure, can improve quality of life and provide a painless and peaceful end to life.

Approaches to providing palliative care will be influenced by health-care infrastructure and resources as well as local cultural and religious values. The current evidence provides little guidance on whether one approach is superior to another and suggests that further studies would be useful (52–54).

SPOTLIGHT PALLIATIVE CARE IN INDIA

In India, even though palliative care is included in the national cancer control programme, it is mainly provided by nongovernmental organizations. There have been some important successes that might be applied nationally. For example, the Pain and Palliative Care Society in Kerala has developed a network of 33 palliative care clinics providing free care to those who need it, with an emphasis on home care. Trained community volunteers helped in providing care together with families who were trained to ensure the continuity of treatment (55).

SPOTLIGHT PALLIATIVE CARE IN SUB-SAHARAN AFRICA

“A Community Health Approach to Palliative Care for HIV and Cancer Patients in Africa” is a joint project in which five countries – Botswana, Ethiopia, Uganda, United Republic of Tanzania and Zimbabwe – and the World Health Organization are working together. The main goal of this project is to improve the quality of life of HIV/AIDS and cancer patients in sub-Saharan Africa by developing comprehensive palliative care programmes with a community health approach.

Uganda is the first country in Africa in which pain relief and palliative care for cancer and HIV/AIDS is a priority in the national health plan. Supported by the work of local nongovernmental organizations, particularly Hospice Africa Uganda, the Ministry of Health has included pain relief and palliative care in the home care package, based on a needs assessment of patients and their caregivers. Services include essential drugs for pain and other symptom relief, food and family support. Palliative care has worked in Uganda because a national programme founded on a public health approach was established, based on the WHO National Cancer Control Guidelines (56–58).

ZAHIDA BIBI

“I WAITED

ZAHIDA BIBI HAS BEEN LIVING WITH DIABETES since the age of 45 and for several years was unaware

that she had the disease. “I was feeling tired and dizzy

all the time. I was also having trouble remembering things and had to urinate a lot,” she recalls. Zahida had consulted a doctor once, but was told that her blood test was normal.

After that, Zahida ignored her symptoms for eight long years before seeking medical care again, this time in Islamabad, 70 km from her home town. A second blood test finally established the nature of the problem and she started feeling much better almost immediately after taking her first shot of insulin.



Name	Zahida Bibi
Age	65
Country	Pakistan
Diagnosis	Diabetes

TOO LONG”



PAKISTAN



As is often true for people living with diabetes, Zahida recently developed serious complications which could have been avoided. One of her legs was amputated below the knee, as a result of an ulcer on her foot going untreated. “The doctor told me that it was connected with diabetes and that I waited too long and should have come to him at the first signs of infection,” she says with regret.

Zahida holds her local hospital responsible for not having detected raised blood glucose in the first place, but admits that she should have reported the ulcer on her foot to her doctor much sooner. Now 65 years old, she is slowly recovering at home from the physical and emotional effects of surgery with the help of her son and daughter-in-law.

Many of the complications of diabetes, such as leg amputation, can be prevented with good health care.

CONCLUSION

Chronic diseases are already the major cause of death in almost all countries, and the threat to people's lives, their health and the economic development of their countries is growing fast. Yet, as this part of the report has shown, the knowledge exists to deal with this threat and to save millions of lives. Effective and cost-effective interventions, and the knowledge to implement them, have been shown to work in many countries.

If existing interventions are used together as part of a comprehensive, integrated approach, the global goal for preventing chronic diseases can be achieved. The only question is how governments, the private sector and civil society can work together to put such approaches into practice. If they do so in the ways outlined in the next part of the report, the global goal for chronic disease prevention and control will be achieved and millions of lives will be saved.

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