

# Interhealth: the WHO integrated programme for community health in non-communicable diseases

In 1978 the World Health Organisation (WHO) made a major change in direction and emphasis through the Declaration of Alma Ata [1]. The main slogan of 'Health for all by the year 2000' (a little optimistic when viewed in 1992) was to be based on the strengthening of primary health care, with the main efforts to be directed away from hospitals and tertiary care and curative medicine to actions in the community and to preventive strategies. It was realised that the world could not afford to pay primarily for high-technology hospitals and high-cost therapeutics if it was to bring health to the majority. 'It is easy for a developing country to go from the ox-cart to the jet age, but in the process it leaves 90% of its people behind.' This comment becomes clear when viewed against the gross national product (GNP) and health expenditure of developing countries. Thus in 1987 there were 26 countries in sub-Saharan Africa with GNPs of less than 400 US dollars per person and half of these countries had shown negative growth over the preceding 20 years [2]. In Tanzania, for example, annual expenditure on health was about US\$2 in 1989/90, compared with US\$7 in 1980. Even in developed countries with much greater resources, there is talk of rationing care and extreme concern at the high cost of hospital services, special procedures, and drugs. Thus for the cost of one heart transplant, a highly skilled community nurse can be employed for a year and deliver preventive services to tens, if not hundreds, of people. The new direction of WHO, putting emphasis squarely on preventive medicine in the community, was thus timely and appropriate to both developed and developing countries.

At the same time, patterns of disease were also changing. Non-communicable diseases (NCDs) such as cardiovascular disease, respiratory diseases, and cancer were already the main causes of mortality in developed countries, and attention was turning to prevention as well as cure. In developing countries there were the beginnings of a shift to non-infectious diseases. By 1984, 16 countries in the WHO Western Pacific Region reported more deaths from non-infectious than from infectious and parasitic diseases combined [3]. Even in sub-Saharan Africa in 1985, although in children the

majority of deaths were due to infection, in the 45–64 year age band 34% of deaths were due to circulatory diseases, 14% to neoplastic disorders, and 5% to accidents [2].

The time was therefore right for WHO to pay attention to NCDs globally rather than just in the north. In the late 1970s and early 1980s several expert committees produced reports on topics such as diabetes [4], ischaemic heart disease [5], hypertension [6], and cancer [7]. These showed that diabetes was rapidly emerging as a world-wide problem, with the prevalence rising to epidemic proportions in the Pacific and in rapidly industrialising countries such as Mauritius. Rates were still thought to be low in the poorest countries with short life expectancy, such as those in sub-Saharan Africa, but from a public health and economic point of view it was evident that preventive strategies were vital. The same was true of ischaemic heart disease, where rates were high not only in the industrialised countries of Northern Europe and the USA, but also in many parts of what was then Eastern Europe. The time was therefore appropriate for emphasis on prevention.

Many of the participants in these WHO committees were, naturally, physicians and scientists with specific knowledge of a particular disorder. The focus was therefore on disease-orientated or vertical programmes. This can lead to major bias in resource allocation and is economically unsound when thinking in terms of community intervention and control. There are, of course, valuable projects dealing with single disorders, such as the MONICA project on ischaemic heart disease, but this should not be the only approach. WHO, which already had a Division of Non-communicable Diseases overseeing most of these disease-specific programmes, therefore convened a series of meetings in 1980 to develop a horizontal community strategy for NCDs [8,9]. Out of this emerged the Interhealth Programme—the Integrated Programme for Community Health in Non-communicable Diseases.

## The Interhealth Programme

Certain basic principles underlie the programme [10].

1. Several major NCDs have risk factors in common, and a unified strategy should be developed for health promotion, preventive measures and control services of these disorders.

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2. There should be total community involvement initially on sample areas to test the effectiveness of interventions, and, if effective, thereafter spread to the whole country.
3. Several strategies should be combined, eg population approaches, high-risk strategy, early screening, inter-sectoral collaboration.
4. Different types of intervention should be integrated, eg changes in lifestyle, reorganisation of health care, reorganisation of other services.

The main disease and risk factors which form part of the Interhealth Programme are shown in Table 1, accidental injury and death being the most notable omissions. The risk factors cover a wide range of environmental and life-style factors, while the disorders form the majority of NCDs in most countries. Emphasis will vary between different countries, but the general principles remain the same.

In many countries the first step in the programme is to identify the main NCD problems. In some countries these are already known, but in many places they are not. Thus information is required first of all to establish a baseline, and then to work out the main aims and objectives of the programme. Next, intervention programmes need to be planned and put in place. These will include behaviour and lifestyle changes, reorientation of health care activities, public education, and treatment of discovered disorders. Thereafter, the impact of these interventions needs continuous monitoring, and finally, the results and conclusions should be implemented. It is, of course, easy to formulate this type of plan in the cool of an air-conditioned, environmentally secure office. The difficulty is to implement such programmes in the field. The initial activity has therefore been to set up a series of demonstration projects.

### Demonstration projects

A series of projects has been established. Some of them were dovetailed into existing programmes such as the North Karelia project in Finland [11] and the Stanford project in the USA [12]; others have been developed *de novo*. The projects were selected to cover a wide range of situations. In Finland, more than 70% of deaths were from NCDs almost 40 years ago [13]. Chile represents a society in transition. Deaths from NCDs accounted for only 39% total mortality in 1954, 53% in 1972, and reached 67% by 1989. Mauritius presents a similar picture although the transition is occurring more rapidly. Areas of the CIS show mortality rates that lie between those of Chile and Finland. By contrast, Tanzania is probably similar to Chile in 1954, ie the transition is just beginning, although precise information is lacking.

Altogether 18 projects have been started in 15 countries, with reports on the first stages now available from nine of them (Table 2). Common to all the projects is the principle that there should be experimental

and reference areas. This creates problems in small countries such as Mauritius where it is difficult to intervene in one area without influencing so-called control areas. This was a special problem in the North Karelia project in Finland where improvements in the control region were almost as impressive as in the experimental area. This is likely to happen when mass media, such as TV, are being used in community education, as they cannot be restricted to a single area. In Mauritius, a national drive on healthy eating and exercise inevitably has an impact on everyone.

The Tanzanian and Mauritius projects are good examples of how the demonstration projects were initiated and have developed. In Tanzania, a group of physicians interested in diabetes contacted WHO in Geneva for advice and help in establishing the prevalence of diabetes. In consultation with WHO a screening programme was developed which included not just diabetes but also other cardiovascular risk factors, such as smoking, hypertension, and lipids, as well as aspects of respiratory disease, history of stroke, proteinuria, and anaemia. This added little to the work involved in doing glucose tolerance tests—most of the work was organising the team and visiting the test areas—and was extremely cost-effective. Rural areas were selected, one in a relatively more prosperous part of the country (Hai district near Kilimanjaro) and one in a poorer region (Morogoro). Experimental and control villages were chosen at random in these areas and the programme became an early Interhealth project [14]. The government was involved at an early stage and community leaders have been closely informed and involved. Baseline information has been collected

**Table 1.** Risk factors and diseases included in the WHO Interhealth Programme

Risk factors	Diseases
Diet	Coronary heart disease
Tobacco	Stroke
Alcohol	Diabetes
Environmental pollution	Cancer
Physical activity	Respiratory diseases
Blood pressure	
Lipids	
Glucose	

**Table 2.** Interhealth demonstration projects reporting preliminary results

Chile	Malta
China	Mauritius
Cuba	Tanzania
Finland	USA
(USSR) CIS	



(Table 3) and interventions started, largely by a Tanzanian team involving the university and Ministry of Health. Coordination is by a national NCD officer with a steering committee.

In Mauritius the government made the first approach, because it correctly perceived the rapid emergence in the 1970s and early 1980s of diabetes and ischaemic heart disease as public health problems, whereas previously they had been minor problems. A multinational team from three WHO collaborating centres in Australia, Finland, and the UK, led by Professor P. Zimmet from Melbourne, undertook baseline surveys, now completed, and advised the government on interventions. Two national NCD officers are in post—one committed to preventive aspects and the other to the curative.

Both baseline surveys have uncovered a wealth of information. Some of this is shown in Table 3, with data from Finland as an example of a country with a long-standing NCD problem.

There are striking differences. Thus, smoking is not a female problem in Mauritius and Tanzania—and has fallen strikingly in Finland. In men, however, smoking in Tanzania has been rising while in Finland the rate has fallen. There are, moreover, marked differences within Tanzania: in the more prosperous area 47% of men smoke, whilst in Morogoro 34% are smokers—reflecting economic differences and a major health problem in Kilimanjaro. Encouragingly, only 24% and 17% of 15- to 24-year-olds smoke in the two areas.

All other CVD risk factors are at lower levels in rural Tanzania. Cholesterol, however, also showed a regional difference: 4.7 mmol/l in Kilimanjaro and 3.7 mmol/l in Morogoro. Similarly blood pressure was slightly higher in the former. Of concern, however, was the fact that more than 40% of the rural population were overweight (body mass index < 20 kg/m<sup>2</sup>), and a similar proportion of both men and women were anaemic, reflecting overall poor nutritional status. By contrast, Mauritius shows a 'full house' of cardiovascular risk, with high diabetes rates and cholesterol values, hypertension and overweight approaching Finnish levels. One third of women and one-sixth of men showed ECG evidence of ischaemic heart disease [15]—double the rates of a slightly older age-group in rural Tanzania [16].

Recent information from Tanzania is alarming. A survey of an affluent group of executives in Dar es Salaam has shown rates of diabetes and hypertension similar to those in Mauritius, with dyslipidaemia and obesity rife and a high prevalence of abnormal ECGs. The challenge now is to maintain the low levels of risk factors in rural Tanzania and avoid the example of the executives, whilst simultaneously improving the health and nutrition of the community. In a related project in the same areas, the major causes of illness, disability, and death are being established and mechanisms introduced to deal with them. In Mauritius, the problem is how to reverse the already adverse risk-factor

**Table 3.** NCD risk factors in three Interhealth demonstration projects

	Finland <sup>a</sup> (North Karelia)		Mauritius <sup>b</sup>		Tanzania <sup>c</sup> (rural)	
	35-64		25-74		35-64	
Age (years)	M	F	M	F	M	F
Current drinkers %	86	63	77	46	65	58
Current smokers %	37	14	58	7	41	3.6
Diabetes %	6.2 <sup>d</sup>	5.9	12.1	11.7	1.1 <sup>c</sup>	0.7
Hypertension %	39	35	16.1	13.8	8.6	10.0
Mean (cholesterol) mmol/l	6.4	6.3	5.7	5.5	4.3	4.3
Body mass index kg/m <sup>2</sup>	26.9	27.1	22.8	24.0	20.5	21.7
Ichaemic ECG % (possible + probable)	NA	NA	17.5*	33.4	7.8 <sup>e</sup>	17.5
Physical activity						

\* age 35-64

+ 40 years and over

<sup>a</sup> taken from ref 13

<sup>b</sup> taken from final report on *Mauritius non-communicable disease intervention programme*, 1987 Survey, Final Report

<sup>c</sup> taken in part from refs 13 and 16

<sup>d</sup> based on oral glucose tolerance tests in 45-64 year group, history in younger group

<sup>e</sup> 15 years and over

profiles—a process that has been under way for many years in Finland.

### Interventions

1. *Prevention.* Interventions are obviously a critical component of the demonstration project. Their nature will differ, depending on the problem, the sociocultural background of the country, and the economic resources of the country. There is little sense, for example, in recommending exercise to rural Tanzanians who already have a high level of physical activity. There will be differences in approach to those countries with very low levels of risk factors, eg Tanzania [16] (primordial prevention), and those where NCDs are already a major problem, eg Finland and Mauritius (primary and secondary prevention).

Several approaches are possible, as outlined by Shigan [10]. In general these will be directed at lifestyle and can be in the form of anti-smoking and anti-alcohol programmes, nutrition and exercise promotional activities. The target groups may vary, thus the main attack may be on adolescents and in schools or at housewives or at the work force. This would be a selective population strategy. Alternatively, a high-risk strategy may be adopted which focuses on those with a strong family history of NCDs, or the obese or, as in Tanzania, the small section of the population who



have switched to an inactive Western lifestyle. Programmes may be run at places of work, or schools, or primary health care centres. Small group educational sessions, posters, radio or TV, or handouts may be used to convey appropriate messages.

There are thus many different potential target groups and methods to convey the desired messages. Many approaches have been used and the Interhealth Programme is collecting different versions of such intervention approaches. Many have not been evaluated—a common problem of health education—and WHO is particularly interested in programmes that have been validated, evaluated, and shown to be effective.

In Tanzania, anti-smoking campaigns in the villages run by local health workers are being developed, and progress directed at preventing change in healthy lifestyles which currently exist. Secondary prevention to avoid stroke in the hypertensive, and infections and amputations in the diabetic person, is also being practised. In Mauritius, a major local (and now national) campaign is directed at healthy eating and exercise, using TV and newspapers as well as locally distributed educational materials.

Staff training is a large component of all these programmes. Here it is hoped that the different Interhealth projects will learn from each other's experience. Courses have been held for project leaders, and are then adapted for the personnel directly responsible for applying the programmes in the different countries. Training of appropriate primary health care personnel is also crucial.

2. *Care.* It is unethical to conduct surveys to detect disease and risk factors, and not to act. In both Tanzania and Mauritius mechanisms have been established to deal with newly detected cases. Both are based on primary health care. Fortunately, the basic approaches to treatment for non-insulin-dependent diabetes, hypertension, dyslipidaemia, and overweight are similar; first, changes in lifestyle including diet, exercise, and non-smoking; and second, pharmaceutical intervention. In rural Tanzania, basic care for new diabetic and hypertensive subjects is provided by local health workers, with physicians involved only in problem cases. The village health workers, who receive six weeks training usually focused on mother and child care, have received an extra two weeks NCD training. This local care avoids lengthy and expensive travel to primary health care centres and district hospitals, although this may be sometimes necessary to obtain drugs. This model of care is now being evaluated and, if proved successful, could be applied to many other parts of the continent.

In Mauritius, NCD clinics have been established in several primary health care centres, linked to continuing screening programmes. NCD record cards are being issued to patients, similar to the 'shared care' cards used for hypertension and diabetes in the UK. Close links are being established with the St Vincent

programme for care, developed by WHO Europe [17], for which Mauritius may serve as a non-European model.

Appropriate therapeutic strategies are needed for those with established NCDs for effective secondary and tertiary prevention. Some will be lifestyle management, but even here proper nutritional guidelines are needed. Similarly, sensible advice is required for therapeutic intervention. This will again vary from site to site, depending on local availability and economic factors. However, guidelines are possible, and are being developed by the Interhealth Coordinating Committee for the treatment of diabetes, dyslipidaemia, and hypertension [18].

### Evaluation and translation

The demonstration projects are of no value if not evaluated and shown to be effective. The North Karelia project is an example of a programme where evaluation has shown a positive outcome. Other programmes are at a much earlier stage of development. The best proof of effectiveness would be to show a fall in disease rates, but this requires a long time. An intermediate objective is to show a change in risk factor levels and an improvement in control of existing disease. This form of evaluation has been adopted in Mauritius and Tanzania. A five-year follow-up survey of risk factors was conducted in Mauritius in April 1992, restudying those previously examined in 1987 together with a new cohort. At the same time all new cardiovascular events were assiduously recorded. The results of the study will undoubtedly lead to modification of the intervention programme.

In Tanzania, follow-up surveys will be conducted during the next two years and any trends to improvement or worsening noted. Studies have also been conducted in urban areas which will give indications of the impact of rural-urban migration and the actions required to modify any deleterious effects.

As the results become available from the different demonstration projects, so they will be applied to the country as a whole. Negative results will prevent the application of useless and wasteful approaches. Positive results should lead to improvement in national health. Application of results will not, of course, be restricted to those countries in which the demonstration projects have been conducted. Results from Mauritius, for example, will be useful for other rapidly industrialising developing countries, and those from Finland can be, and are being, applied in many developed nations. In several countries, Interhealth will link up with the European CINDI programme, which involves countrywide intervention for NCDs [19].

### Conclusions

The WHO Interhealth project is a novel approach to an integrated programme for prevention and control



of interrelated non-communicable diseases. The involvement of a wide range of nations covering a variety of stages of health and economic status and development means that a range of approaches is being developed which should be applicable to many other countries worldwide. The use of demonstration projects makes possible the development of a series of discrete, evaluable approaches with properly assessed outcomes. The emphasis on primary health care and prevention should lead to the development of cost-effective health programmes, and hopefully, in the end, lessen the burden of many NCDs on world health.

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