Protocol and Guidelines

Countrywide Integrated Noncommunicable Diseases Intervention (CINDI) Programme

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Countrywide Integrated Noncommunicable Diseases Intervention (CINDI) Programme

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TARGET 4

REDUCING CHRONIC DISEASE

By the year 2000 there should be a sustained and continuing reduction in morbidity and disability due to chronic disease in the Region.

Keywords

NONCOMMUNICABLE DISEASE CONTROL
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Preface

The WHO Countrywide Integrated Noncommunicable Diseases (CINDI) programme began in the early 1980s with preparatory meetings, and gradually countries signed an agreement with the WHO Regional Office for Europe to take part. The protocol and guidelines for the programme were prepared and published in 1987.[1]

Since then, the CINDI programme has grown to be a major European collaborative effort for the prevention of noncommunicable diseases and the promotion of health in the WHO European Region. It is also one of the main vehicles for implementing the regional policy for health for all. At present, 20 countries are members of the CINDI programme.

The CINDI programme directors have met annually to review the progress of programme activities and to decide on future directions. According to the decision of the CINDI Council of Programme Directors, the CINDI Management Committee started to revise the CINDI Protocol and Guidelines to take account of current developments and needs.

I hope that this updated version will both help the member countries in their work and inform other countries and interested organizations about CINDI principles and strategies.

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Chairman, CINDI Management Committee

[1] Leparski, E. & Nüssel, E., ed. *CINDI Countrywide Integrated Noncommunicable Diseases Intervention Programme. Protocol and guidelines for monitoring and evaluation procedures.* Berlin, Springer-Verlag, 1987.

Helsinki, Finland

Introduction

Noncommunicable disease (NCD) represents the major health burden in Europe and North America and thus an area in which major health gains can be made. Three out of four deaths are due to cardiovascular diseases, cancer or other external causes, such as trauma resulting from accidents, suicide and homicide. Many NCDs or events leading to them have their roots in unhealthy lifestyles or adverse physical and social environments, and are thus either preventable or amenable to early detection and management.

In 1984, the Member States of the WHO European Region adopted a policy and 38 targets to attain health for all. The discussion of target 4, on reducing chronic disease[2] – states that:

> People in the Region would benefit from comprehensive policies on the prevention of chronic noncommunicable diseases and the alleviation of their consequences. A useful approach is the countrywide integrated noncommunicable disease intervention (CINDI) programme, which emphasizes primary care, multisectoral action and community participation.

The countrywide integrated noncommunicable diseases intervention (CINDI) programme, in which 22 countries participated in 1994, is one of the principal vehicles for delivering health for all. It rests on an extensive body of knowledge and experience, built up from carefully evaluated health promotion and disease prevention programmes in a number of European and North American countries. These programmes have demonstrated the effectiveness of countrywide and community-based integrated approaches to reducing smoking, bringing about healthier eating patterns and lifestyles, and thereby reducing premature mortality due to major chronic diseases and conditions.

[2] *Health for all targets. The health policy for Europe*. Copenhagen, WHO Regional Office for Europe, 1993 (European Health for All Series, No. 4).

The programme's aim is to support the development in Member States of comprehensive, integrated policies for the prevention of NCDs and the alleviation of their consequences by:

- combining health promotion and disease prevention efforts and developing intersectoral collaboration and community involvement;
- enhancing the role of health professionals; and
- making better use of existing resources.

Historically, one can distinguish the following overlapping phases of the development of CINDI:

- the development of the concept and protocol and the design of an evaluation system in 1981–1985;
- the development of national programmes and the creation of an international network in 1982–1988;
- the implementation of national demonstration programmes in 1985–1992; and
- the review and development of the CINDI policy framework to meet the challenges of the European strategy for health for all in 1990–1992.

An important step towards developing a coordinated European policy to reduce the burden of NCD was a meeting on the CINDI initiative that was held in Belfast in October 1991. Representatives of the health ministries in all CINDI member countries took part. The recommendations were intended for use in all European countries and Canada.

Policy development consultations took place in Hungary in 1990; in Austria, Lithuania and the United Kingdom in 1991; and in Iceland, Israel and the Russian Federation in 1992. The conclusions reached, together with other CINDI documents, are summarized in a report, which specifies priorities for international collaboration on CINDI, coordinated by the

Regional Office.[3] The report provides for integrated action to control NCDs and assists individual CINDI countries to define their own strategies and to identify areas for joint action. It describes the challenges and health issues facing CINDI, presents an analysis of the potential value of different strategies in addressing the issues, and gives goals, options and priorities for action.

CINDI has been one of the most active WHO programmes in influencing health professionals to adopt health for all principles and in mobilizing them for action. It provides scientific support to health for all through the application of a comprehensive protocol, including an information system as a built-in evaluation mechanism that can be applied in any country at any level. It has contributed to the formulation and development of health policy at both the national level (Canada, Israel and Lithuania) and subnational level (Baden-Württenberg, Germany; North Karelia, Finland and Northern Ireland, United Kingdom). It has demonstrated the feasibility of building and maintaining subnational, national and international scientific information and evaluation systems for NCD prevention. It has created a network of countries that work together on a common problem and reinforce each other's efforts.

The CINDI programme has proven to be an effective mechanism for cooperation between countries providing financial assistance (such as Austria and Canada) and the countries of central and eastern Europe (CCEE) and the newly independent states (NIS) of the former USSR. This makes it an important instrument of social development in the new Europe.

[3] *Positioning CINDI to meet the challenges. A WHO/CINDI policy framework for noncommunicable disease prevention*. Copenhagen, WHO Regional Office for Europe, 1992 (document).

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Justification for the CINDI programme

If health for all in Europe is to be attained, two basic issues must be tackled. The first is to reduce inequalities in health between and within countries. The second issue is to strengthen health, as well as reduce disease and its consequences. Thus, health for all in Europe has four themes:[4]

- *ensuring equity in health* by reducing gaps in health status between countries and between groups within countries;
- *adding life to years* by helping people achieve, and use, their full physical, mental and social potential;
- *adding health to life* by reducing disease and disability;
- *adding years to life* by increasing life expectancy.

The WHO strategy for health for all, unanimously adopted by the Region's Member States, offers both a challenge and a powerful tool to realize the vision of people's health as an integral and inseparable part of overall social development.

Improving people's health involves not only the health services, with their predominantly curative function, but also all sectors responsible for creating health promoting social, economic, physical and cultural

[4] *Health for all targets. The health policy for Europe*. Copenhagen, WHO Regional Office for Europe, 1993 (European Health for All Series, No. 4).

environments. These can make healthy lifestyles easy for people to choose.

This principle of intersectoral action has served as a basis for the innovative development of an integrated, multidisciplinary, community-based approach to control and reduce the prevalence of NCDs. This approach emphasized promoting health and preventing disease through existing health care systems and the active participation of both communities and individuals. Its scope is thus broader than the traditional delivery of health by services alone. It promotes responsibility for health both in the individual and in the community, and its strategies are designed to facilitate change in both, and in all sectors of society.

The CINDI programme embodies these principles, representing a practical implementation of the health for all strategy in relation to NCDs in the European Region and Canada. The programme has gathered experience in the integrated prevention of NCDs through primary health care at the local level. This experience is beginning to have an impact at the national level in all CINDI member countries.

CINDI focuses on the commonality of risk factors for and intervention against NCDs, sets targets and then scientifically evaluates progress towards their achievement. Target setting, intervention and the evaluation of intervention methods are key parts of CINDI. Intersectoral collaboration at all levels is crucial in ensuring its success. CINDI was largely based on experiences gained in another European project coordinated by WHO: the comprehensive cardiovascular community control programme.

Established in 1985, the CINDI programme is an attempt to implement the health for all strategy in a practical way. CINDI is a cooperative international effort that provides participating countries with an approach or framework for activities to prevent and control risk factors that are common to a number of NCDs, such as smoking, high blood pressure, high blood cholesterol and excessive alcohol consumption as well as addressing their social and environmental determinants.

Implementing this approach to NCD prevention requires:

- the attainment of a balance between medical activities (or those focusing on the individual) and health promotion efforts aimed at the community; and
- cooperation with sectors other than health, so that the numerous societal issues that influence the development of NCDs – and indeed health in general – may be tackled in a comprehensive manner.

CINDI programmes can learn from the experience gained through a number of multifactorial interventions in the area of cardiovascular diseases. The North Karelia experience, for example, which has been extensively documented and evaluated, has underlined the merits of an integrated approach. Many of the lessons learned from these projects can be applied in the prevention of NCD in general.

The concept of integration reflects the recognition of a commonality of a number of risk factors connected with various chronic diseases. The simultaneous reduction of several common risk factors would reduce the major NCDs. The following examples justify the inclusion of certain NCDs in the integrated programme framework.

Cardiovascular diseases

Cardiovascular diseases (CVD) are the main killers of the population in Europe, as well as an important cause of disability. They account for about half of all deaths in the Region. Ischaemic heart disease is the single largest cause of cardiovascular mortality, responsible for 30–60% of deaths.

The extent of the risk is significantly influenced by a number of personal and population characteristics that can act separately or in com-bination. In turn, these characteristics are largely determined by social and cultural factors and are therefore modifiable. They include eleva-ted blood pressure and blood cholesterol, poor nutrition, lack of phy-sical activity

and smoking. Even a small reduction in the average blood pressure of the population could bring about a large reduction in disease.

The role of habitual diet and blood cholesterol–lipoprotein level is well established and judged to be causal. Smoking, especially of ciga-rettes, contributes significantly to the occurrence of coronary heart disease, and high alcohol intake is associated with an increased risk of the disease, as well as high blood pressure.

Lack of physical activity is associated with higher levels of the major risk factors, primarily because of the increased prevalence of obesity. Regular exercise may help to reduce high blood pressure and blood cholesterol.

According to target 9 of the regional strategy for health for all, by the year 2000 mortality in the Region from diseases of circulatory system in people under 65 should be reduced by at least 15%.

Cancer

Cancer is the second major cause of mortality in Europe and is res-ponsible for some 30% of all deaths in men and about 40% in women in the group aged 35–64 years. Lung cancer is the largest single contributor to total cancer: most cases are due to smoking, especially of cigarettes. The other most important types of cancer are those of the stomach and intestines, and breast cancer, which is the leading form in women aged 35–64.

According to target 10 of the regional strategy, mortality from cancer in people under 65 should be reduced by at least 15% by the year 2000. The reduction of smoking is the most important contributor to the prevention of cancer morbidity and mortality. The modification of nutritional, reproductive or infective factors may substantially alter cancer risk, and the limitation of occupational exposures, air pollution and the iatrogenic use of X-rays and certain drugs could also help to prevent cancer. In

addition, regular screening could halve mortality from cancer of the cervix.

It is very important that effective diagnostic and treatment technology be available to everyone in need.

Accidents

Accidents constitute the third leading cause of death in the European Region. Motor vehicle accidents account for about 40% of accidental death, accidental poisoning, about 45% and accidents at work, about 15%.

Target 11 calls for a reduction of at least 25% in deaths from accidents in the Region by the year 2000 through intensified effort. This requires the development of multidisciplinary and intersectoral policies and programmes to determine and then eliminate or reduce hazards especially in the home, on the roads and at work. Consi-deration should be given to improving the system of information on accidents, to state the place of occurrence in each case.

NCDs to be addressed

The list of NCDs to be addressed should not be limited, but priority should be given to those with common risk factors, such as chronic respiratory disease, diabetes mellitus and dental caries. In addressing risk factors, the following criteria should be taken into consideration:

- risk factors should be connected to several, mainly leading NCDs;
- the risk factors selected should be important; and
- there must exist methods to intervene and to assess changes.

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CINDI objectives and policy framework

Objectives

CINDI's overall objective is to improve the health of populations by reducing mortality and morbidity from major NCDs through an integrated collaborative intervention programme of prevention and health promotion. The main objective is to reduce simultaneously the common risk factors of major NCDs, such as smoking, unhealthy nutrition, alcohol abuse, physical inactivity and psychosocial stress.

To achieve these objectives, effective collaborative mechanisms and methodologies for integrated, intersectoral NCD prevention and control should be established in CINDI member countries. The international WHO CINDI programme provides a mechanism through which member countries can share their experience.

The programme has five main practical objectives. The first is to achieve a coordinated approach to the prevention or reduction of NCDs. This requires the establishment of a suitable organizational structure for implementing the programme and the drawing up of national guidelines for its further development.

The second objective is to develop a comprehensive approach to public education, a service structure and other strategies for the prevention and control of NCDs. The major target groups, intervention channels and strategies should be identified, and guidelines for reaching them set.

Third, information support should be developed for the implementation and monitoring of the programme. This requires the development and use of appropriate indicators of outcome and process in relation to the various risk factors, and the identification of types of NCD.

Fourth, the results of the programme should be evaluated. This requires the measurement and follow-up of appropriate indicators in the CINDI population, in order to assess the process and effectiveness of the programme and to give feedback for its further strengthening.

The fifth objective is to promote research into the prevention and control of NCDs, and to establish methods, facilities and activities for this purpose.

Main programme features

Member countries should plan and carry out national CINDI programmes that employ the objectives and strategies given here, and that would cooperate with the international CINDI programme in the WHO Regional Office for Europe. The aim in each CINDI country should be to carry out a nationwide programme that integrates and coordinates several strategies and activities (see Annex 1).

Most countries use a demonstration area for testing and training in support of the national programme. In general, the demonstration and national activities should be developed at the same time, and experiences from the former should be continuously kept in mind to streng-then the nationwide programme. In addition, the programmes in the member countries can be developed in stages.

All relevant organizations and administrative structures should be involved in an intersectoral framework to implement the programme. Central coordination should be the task of the ministry responsible for health. An executive project team, responsible for realizing the policies, objectives and targets of the programme, would be of vital importance.

This team could be located within the health ministry, a national institute or university, or some other well chosen site.

Each national team should prepare a detailed protocol and plan of action for implementing the programme at the national level, in close consultation with the international CINDI management and the Regional Office (see Annex 2). This has to be done at the start of the programme, and the plan is to be updated periodically.

In general, the following stages and parts should be considered:

- a situation analysis;
- the establishment of national project management;
- the finalization of the national protocol and plan of action;
- the development of guidelines and methods for intervention on the common risk factors;
- a baseline survey;
- the start of intervention;
- meetings of national programme directors and the directors' participation in international CINDI meetings;
- joint major evaluations at five-year intervals; and
- the further development of the national CINDI programme.

The Regional Office and the international CINDI Management Committee will maintain their active support of the countries by arranging meetings, visits, consultations and other assistance.

CINDI membership is open to all Member States of the WHO European Region. Other WHO Member States may consider joining CINDI to meet their particular needs, as Canada has done. After the initial wave of countries joined the programme, several others later joined or considered joining CINDI. This reflects the changing political and health care situations in Europe.

Central policy issues

The policy consultation process within the international CINDI programme has revealed a wealth of experience in interventions to prevent NCDs, and considerable potential for effective collaboration among national programmes and between them and the WHO Regional Office for Europe. The central policy challenges may be described as: achieving an integrated approach, adopting an intersectoral way of working, bridging the gaps between science and policy, and enhancing international collaboration.

Striving for an integrated approach

The concept of integration is central to CINDI. It implies the recognition that a number of risk factors (mainly related to lifestyle) are common to major NCDs. CINDI promotes joint action on these risk factors as an efficient way to reduce the incidence of the diseases.

In practical terms, integration means building on existing health infrastructures and resources, and covering the full continuum of health promotion, disease prevention and health care. CINDI has an important role to play in identifying gaps in local and national preventive activities and providing a focal point for the coordination of these activities. Integration also means putting in place multiple health intervention modules to address the major risk factors in all relevant groups of the population. These modules need to cover a range of strategies and to have the support of relevant organizations. The managers of CINDI projects should seek to facilitate the linkage of different modules by establishing mechanisms for planning and coordination.

The activities undertaken in CINDI demonstration areas or in community settings need to be harmonized with policies and programmes at the national level. Integration offers advantages: increased consistency among health policies, public education messages that are coherent and mutually reinforcing, and the diffusion of results to other communities, thereby raising the profile of CINDI across the country.

Multifactorial interventions to prevent CVD have been successful. In the 1970s, a number of European countries took part in the WHO comprehensive cardiovascular community control programme, which demonstrated the feasibility and effects of integrated community-based approaches. The pioneering North Karelia project, extensively documented and evaluated, is a notable example of a successful integrated prevention initiative.

Integration implies the need to work in partnership. Although the partnership model is still relatively new, the experience of CINDI programmes to date suggests that it has many advantages. As CINDI accumulates experience in this area, individual programmes and member countries will have much to share.

Two international conferences held in CINDI member countries have issued major policy statements endorsing and elaborating on integrated approaches for the prevention of NCDs: the Belfast Resolution on the Prevention of Noncommunicable Diseases[5] and the 1992 Victoria Declaration on Heart Health.[6]

Intersectoral action

The prevention of NCDs calls for collaboration between not only the various parts of the health sector but also the health and other societal sectors. CINDI should take a lead in creating coalitions, or support the efforts of health departments that may have overall responsibility for coordination at the national level. Depending on the issue at hand, a comprehensive intersectoral prevention effort might include agriculture, education, finance, transport, environment, labour, housing and consumer affairs, as well as the mass media, trade unions and nongovernmental groups such as the Red Cross, religious institutions and sports organizations. The area of nutrition provides an example. Comprehensive

[5] *Belfast recommendations.* Belfast, Northern Ireland Health Promotion Agency, 1991 (document).

[6] *The Victoria Declaration on Heart Health.* Ottawa, Health and Welfare Canada. 1992 (document).

policies that include public and professional education, skill development and the accessibility of healthy diets cannot be achieved without collaboration among government, voluntary agencies, the agriculture sector and the food industry.

Many countries have established strong links between their CINDI programmes and other WHO programmes, such as the Healthy Cities project. By forming alliances with professional associations and voluntary organizations, such as those concerned with cancer, heart disease and diabetes, CINDI programmes can widen their networks, expand their resource base and benefit from partnership at the community, national and international levels.

Bridging the science–policy gap

Demonstration programmes form the backbone of most CINDI programmes. They serve to test intervention approaches on a limited scale, as well as raising public awareness of the need for and benefits of NCD prevention. Instead of trying to convince decision-makers and the media with theoretical arguments, CINDI programmes can refer them to tangible results.

The experience gained in several national demonstration programmes, such as the one in North Karelia, has shown that they can provide a powerful tool for the development of national policy. They not only generate new intervention knowledge but also provide opportunities to build skills and to create models that can be used by other communities across the country.

CINDI demonstration programmes typically have the following components:

- the application of existing prevention knowledge at both the individual and community levels;
- information systems to support the planning, monitoring and evaluation of interventions;

- process and outcome evaluation, to assess the value of interventions and to compare them with approaches used in other CINDI programmes;
- organizational structures, such as coalitions and coordinating committees, to support concerted preventive activities at the national, regional and community levels; and
- linkage to relevant national health policies, such as legislation on smoking or practice guidelines for preventive medicine.

A CINDI demonstration programme may involve a community, a region (such as Setubal in Portugal and Chelyabinsk in the Russian Federation) or an entire country (such as Malta). Managerial structures may vary from programme to programme. In some CINDI programmes, the demonstration programme operates out of the national or regional health department; this is the case in Northern Ireland and Nova Scotia, Canada. In other programmes, the management is based in academic centres, as in Kaunas, Lithuania and Baden Württenberg, Germany. Still others have been initiated by nongovernmental organizations, such as in Vorarlberg, Austria.

Experience has shown that, regardless of how they are organized, demonstration projects need to be professionally planned, implemented and evaluated. The more successful demonstration projects have the support of national authorities, and are operationally linked to national programmes and policies. In practical terms, this means devoting staff time and other resources to the task of keeping national authorities abreast of activities and results; there is no question of waiting until the demonstration is over to disseminate the CINDI experience.

In the demonstration programmes, policy research on the cost–effectiveness of preventive strategies can help significantly in gaining support from health care authorities. A good example is the work done in Israel on the cost–effectiveness of nonpharmacological treatment of high blood pressure. Several countries, including Finland, Germany, Lithuania and the Russian Federation have developed mathematical models to

evaluate the long-term benefits of prevention, using data from prospective epidemiological studies.

Results from CINDI demonstration programmes can play a major role in helping to bring about the consensus that forms the basis for prevention policy. Judging when there is enough scientific knowledge to support policy-making is a responsibility that lies jointly with scientists and practitioners. In NCD prevention, the available scientific evidence – even though incomplete – has often been assessed as sufficiently sound to justify public health action.

Enhancing international collaboration

One of CINDI's strengths is that its programmes draw on knowledge gained from national and international epidemiological and preventive studies. CINDI provides a mechanism whereby member countries can share their experience in developing their national programmes.

CINDI site visits and consultations have indicated that international collaboration would be particularly valuable in programme planning, protocol development and the dissemination of programme results. The WHO CINDI programme can provide: access to research literature, translation of resource materials, improved communication with other programmes of the Regional Office for Europe, and workshops and events at which participants can exchange information on issues of concern.

CINDI will profit from closer working relationships with a number of international professional societies. Potential partners include the World Hypertension League, the International Diabetes Association, the World Organization of Family Physicians, the International Union for Cancer Control, the International Heart Health Network, the European Atherosclerosis Society and the American Heart Association's Council on Cardiovascular Disease Epidemiology.

As a group, CINDI member countries reflect not only a mixture of cultures, experiences and ideas but also a wide range of political and social systems and approaches to health. CINDI provides its members with a common conceptual framework and an organizational context for joint activities. The Heidelberg, Helsinki and Moscow centres provide extensive support for intercountry activities for database development and the evaluation and reporting of protocols for CINDI programmes.

CINDI's main objectives relate to common risk factors and related lifestyle changes in the population, thus emphasizing primary prevention and health promotion. In addition to the previously mentioned risk factors, CINDI programmes in countries should consider other factors that are relevant in local conditions, such as oral hygiene or drug abuse, etc. In addition to primary prevention, the national programmes may include objectives related to secondary prevention: the early detection and treatment of, and rehabilitation from certain major NCDs. All objectives must be specified in operational terms, and achievable goals should be set within the programmes, particularly to permit evaluation.

Key intervention issues

General principles

CINDI intervention programmes should be based on the previously mentioned objectives and strategies. They should be comprehensive and combine several strategies, especially the following.

Because primary health care embraces both primary and secondary prevention, the tasks of the programme should be integrated with those of the health services, which may have to be reorganized.

The aim should be to train people so that they will be in a position to make the necessary behavioural changes, to persuade and help them to effect such changes and to provide the required social and environmental support. The general educational activities would involve the use of the

mass media, the preparation of educational materials, the convening of meetings, etc. Teaching in schools should also be involved.

The aim should be to mobilize community resources to the greatest possible extent to support the attainment of the programme's aims. This would include both formal decision-making and informal approaches, and would involve other public services, voluntary organizations, occupational activities, churches, etc. The involvement of key lay people should also be considered.

Finally, public policy mechanisms for action in other sectors should serve the programme's overall aims by modifying the environment, changing production patterns, influencing prices, etc. This may be done through legislation, government or local decisions, or voluntary decisions by industry. The programme may also try to stimulate demand by the population for such action.

CINDI emphasizes the integrated approach to risk reduction by aiming preventive programmes at the population as a whole, as well as groups at particular risk. In addition to the general adult population, several CINDI programmes have special activities for children and youth, the elderly and disadvantaged groups.

The settings for intervention range from national action to (demonstration) communities, and include schools, work places and health centres and the facilities of voluntary organizations. Usually the intervention combines several settings.

Challenges related to risk factors

Data on risk factors provided by member countries to the CINDI Data Management Centre show that, among people aged 25–65 years, the range of prevalence of selected risk factors is as follows:

Regular smoking	29–56%
High blood pressure (≥ 140/90 mmHg)	15–60%

Abnormal blood lipids (total cholesterol ≥ 5.2 mmol/litre or 200 mg/dl)	45–80%
Obesity (body mass index (BMI) ≥ 30)	11–38%

In most CINDI member countries, more than two out of three adults have one or more of the major risk factors for CVD. The situation is all the more serious as people with more than one risk factor, even at moderate elevation, are at significantly increased risk.

Lifestyle factors

Smoking not only plays a role in the development of cancer but is the main contributing factor in about a third of all cases of CVD. The eradication of smoking is now recognized as the single most effective means of improving the health of the population in industrialized and many developing countries. Many CINDI member countries have pursued comprehensive antismoking strategies that have led to marked decreases in smoking rates. In those where governments have not given high priority to the issue, there is no systematic approach to smoking prevention. CINDI programmes have an opportunity to foster the development of comprehensive antismoking strategies through an intersectoral approach. Organizations of health professionals have a particular responsibility to sensitize their members to the importance of serving as nonsmoking role models.

Appropriate dietary habits and the maintenance of energy balance (healthy weight) are fundamental to the prevention and control of several of the risk factors for CVD, such as hypertension, diabetes, hypercholesterolaemia and obesity. In addition, some evidence indicates that increasing the consumption of vegetables and fibre and reducing fat intake may help to prevent some major types of cancer. Several CINDI member countries have made recommendations on nutrition. With few exceptions, however, most lack reliable data on food consumption patterns.

The issues in nutrition are wide-ranging and best addressed using an intersectoral approach. For example, consumers need to have healthy

food available at affordable prices, as well as proper nutritional information when they buy their food. Member countries should be aware of the profound effect that widespread dietary change could have on agriculture and the food industry. The feasibility of nutrition policies depends on the degree to which they take account of the social and economic realities in countries. The most effective nutrition policies would be those developed jointly by all partners who have a stake in the issue in both the public and private sectors.

In CINDI member countries, 11–38% of the population aged 25–64 is obese. Obesity is linked to a wide range of morbidity. Abdominal obesity, in particular, is associated with several of the major risk factors for heart disease: high blood pressure, abnormal blood lipids and triglycerides, and non-insulin-dependent diabetes mellitus. Obesity is reaching epidemic proportions in both the industrialized and the deve-loping world, and CINDI member countries are no exception. A number of practical approaches can be taken to prevent obesity. They include: raising public awareness of the primary role of physical inactivity as a determinant, providing information to the public that encourages individuals to assess their own healthy body weight, and developing appropriate dietary and exercise programmes in the workplace.

Physical activity and personal fitness contribute to the proper maintenance of energy balance, and to health and wellbeing in general. Data from some CINDI member countries suggest that one out of two adults leads a sedentary lifestyle, and that the proportion is even higher among older adults. Most CINDI programmes include physical activity components, often aimed at children and youth, and some programmes have joined forces with national and other sports organizations to run social marketing programmes that promote active living. Lifestyle programmes offering a combination of exercise and diet would be most appropriate for the primary prevention of nutrition-related disorders such as obesity, high blood pressure and hypercholesterolaemia.

Alcoholism and drug dependency are major public health problems in CINDI member countries. The burden of acute and chronic disease

resulting from alcohol use is well documented. In some member countries, the death rates for cirrhosis of the liver have increased markedly in the last two decades. Recently there has been evidence of increases in alcohol consumption in some of the CCEE and NIS. Firm scientific evidence has shown the link between alcohol consumption and the development of high blood pressure, even at rates not widely considered to be excessive (under two drinks per day). The promotion of social norms supportive of moderation is a challenge for all CINDI programmes. Other possible avenues through which CINDI programmes can help address this major societal issue include health education for professionals and advocacy for greater intersectoral coordination among agencies responsible for alcohol policies.

Biological factors

High blood pressure is a major public health problem in all CINDI member countries. While some have experienced a decline in stroke mortality rates, others have seen increases. About one out of five people in member countries has high blood pressure, and a large proportion of hypertensives do not have their condition under control. It is increasingly recognized that hypertension control should form part of an overall effort to control the risk of CVD: that is, one that addresses other risk factors that might be present, such as smoking, abnormal blood lipids and obesity. Research in some CINDI programmes has shown that improved patient education, coupled with nonpharmacological management as sole or adjuvant therapy, can enhance the control of high blood pressure and produce savings for the health care. Moreover, nutritional interventions for primary prevention at the community level have met with remarkable success, as documented in the Portugal CINDI programme.

Over 15% of the population in most CINDI member countries has highly abnormal blood lipids (serum cholesterol $\geq$ 6.2 mmol/litre), and the rates are twice as high in several countries. Most CINDI programmes try to identify and manage individuals at high risk though case-finding in primary care and occupational health care settings. A complementary approach – and one that is likely to be more cost-effective in the long

term – would be the implementation of effective nutrition policies, to reduce the mean consumption of saturated fat in the population.

Diabetes is a potent risk factor for CVD and other disabling diseases. In most CINDI member countries, only about 5% of diabetics is aware of this risk factor, the figure is higher in Malta and in former Yugoslavia. Some member countries are working jointly to develop primary and secondary prevention strategies in the context of the 1989 St Vincent Declaration on diabetes care and research. This should provide CINDI programmes with a useful model for control activities directed at other chronic diseases, particularly from the perspective of the quality of care.

Multiple risk factors

Several studies have documented the prevalence of the major NCD risk factors and their additive and even synergistic effect on, for example, the risk of developing CVD. Studies in adult men have shown that the risk of ischaemic heart disease doubles as the level of blood cholesterol increases from 5.2 to 6.2 mmol/litre. The risk doubles again in the presence of high blood pressure. The Framingham study showed that the gradient of risk increased as additional risk factors were added. When age, gender, systolic blood pressure, cholesterol, cigarette smoking, glucose intolerance and left ventricular hypertrophy (detected by electrocardiography) were added, the risk increased thirty-fold. Even moderate increases in several risk factors have been related to increases in CVD risk. As a result, multifactorial interventions reaching large audiences are likely to be attractive options for policy-makers.

Psychosocial factors

Psychosocial factors (such as job strain, and feelings of anger and hostility) are increasingly recognized as playing a role in the development of CVD. Surveys in some CINDI member countries show that the public perceives stress as a major contributing factor. The Victoria Declaration emphasizes the need for more research on the effects of stress and other psychosocial factors on lifestyle. In CINDI, action on psychosocial factors might be taken within the context of occupational health

programmes, or through measures aimed at reducing the stress related to work or unemployment, and unhealthy physical environments. Further, poverty and social disadvantage are associated with higher levels of NCDs. This has particular significance for CINDI, given the political and social changes and the attendant economic hardships in the CCEE and NIS.

Accident-related factors

Accident prevention is a CINDI concern, since accidents are a major cause of death and injury, and preventive measures relate to certain types of behaviour, such as alcohol use. The agenda is broad. The WHO targets for health for all focus attention on the prevention of injury, disability and death in the following areas: the responsible handling of motor vehicles, road safety, personal safety habits (such as avoiding drink-driving, and using safety belts and reflectors), and the prevention of home, work, sports and leisure accidents. CINDI programmes might give increased attention in the future to this major public health problem, which affects all population groups.

Breast and cervical cancer screening

Some CINDI programmes have organized screening programmes for breast and cervical cancer that have gained international recognition. In other countries, such programmes in the context of CINDI are in the planning stage; Canada will soon launch an initiative. Here CINDI member countries can collaborate on the development of databases to facilitate the planning and evaluation of cancer screening.

Dental health

Some CINDI programmes have involved preventive dental health activities. They often relate to other CINDI objectives, such as diet. In addition, dental workers can contribute to other CINDI activities, such as those for nonsmoking.

Environmental hazards

Environmental health is an emerging area of concern for the CINDI programmes in some countries, where rising public awareness about radiation and the chemical contamination of food, air and water is adding to the urgency of tackling these problems. CINDI programmes could undertake similar advocacy efforts. There are opportunities for collaboration on the development of epidemiological databases on relevant environmental hazards, and the establishment of projects to track the long-term effects of interventions.

Evaluation

Each CINDI programme should arrange for evaluation and monitoring to assess its results and to get feedback for continuing development. A more comprehensive evaluation can be arranged for a demonstration project, while the evaluation mainly focuses on the countrywide programme.

Each national CINDI programme will organize its own evaluation and monitoring, based on the local situation and opportunities. Each member country should use the CINDI evaluation measures specified later, and thus contribute to the international evaluation.

Evaluation within CINDI should be concerned both with the process and the outcome of programmes. Process evaluation refers to information on how the activities are implemented and the target populations reached. It calls for clear definition of the programme's methods and strategies, and indicators of their implementation. It also calls for reference to behavioural objectives and their indicators. Process evaluation uses information on programme implementation (such as logs and inquiries) and from population surveys.

Outcome evaluation refers to information on changes in lifestyles and risk factors, and should monitor information on changes in NCDs. For outcome evaluation, indicators of progress towards the objectives should be clearly defined and carefully measured. Information comes from statistics (such as those on mortality, hospital discharge and diseases) and

from carefully standardized surveys of the behaviour and risk factors of random population samples.

The CINDI protocol specifies the core indicators and methods of their measurement for international collaboration. The member countries agree to supply this information to the international CINDI data management.

The main aim of the CINDI evaluation is to assess changes in the main objectives for risk factors and lifestyles and to achieve a good understanding of programme performance. The aim is not a scientific inference concerning a cause–effect relationship. The rates of major NCDs are monitored to get important background information for the programme and to give feedback about the national trends. The international comparison of CINDI data should show the value of different intervention measures in different cultures. The information yielded by an evaluation should be used to make continuous improvements in the programme.

3

Key intervention strategies

CINDI programme strategies should integrate activities relating to different parts of the health sector (health promotion, disease prevention and health care – treatment and rehabilitation) and some of those undertaken by other sectors. They should be focused on:

- health services
- public education
- community organization
- regulation.

The priorities of the strategies for intervention and international collaboration in most CINDI member countries are:

- policy development, legislation and coordination
- marketing and organizational development
- public education and the mass media
- guidelines for practice
- professional education and involvement.

The following discussion reflects some main strategies. It refers both to CINDI demonstration programmes and to national activities – experience from the demonstration areas often showing the way for national implementation.

Policy development, legislation and coordination

In the context of CINDI, policy means consensus among relevant partners on issues to be addressed and on the approaches or strategies to use in doing so. The CINDI programme could stimulate action on policy at the national level and, through the exchange of experience, facilitate the attempts of member countries to implement preventive policies.
Primary health care has a crucial role in the implementation of policies for NCD prevention and control. CINDI has the potential to influence primary health care systems to adopt a more preventive orientation. The 1991 report on a workshop on the role of the general practitioner in CINDI,[7] and the experience of the WHO network of collaborating centres for primary care reveal the wide range of organizational approaches that European countries have used to establish prevention as a routine component of primary health care. Israel, Malta and Spain, among others, have legislation establishing primary health care centres as focal points for disease prevention and health promotion activities.

Intersectoral coordination in policy development, dealing with such issues as smoking, nutrition, fitness and accident prevention, should involve a wide range of interest groups and sectors. For example, helping consumers to choose healthy nutrition involves health education, the production and supply of food, marketing issues, pricing policy and consumer demand. Countries within and outside CINDI offer models for intersectoral policy development and coordination, such as Finland, Iceland and Norway.

Many CINDI member countries have established coordinating mechanisms to facilitate the planning and implementation of local and national programmes. Some countries, such as Lithuania, Malta and Slovakia, have set up national intersectoral councils. Others, such as Austria, the Czech Republic, Germany, Hungary, Israel and Portugal have established local coordinating bodies.

[7] *The role of the general practitioner in the CINDI programme*: report on a WHO meeting. Copenhagen, WHO Regional Office for Europe, 1992 (document EUR/ICP/NCD 218 (R)).

One of the regional targets for health for all addresses the development of healthy public policy, in recognition of the fact that policies emanating from sectors other than health can have a profound influence on people's lifestyle choices and health. The objective of healthy public policy – called for at the WHO international health promotion conferences in Ottawa in 1986, Adelaide in 1988, and Sundsvall in 1991 – is to secure social and institutional consensus on supportive action outside the health domain and explicitly to recognize health and equity in all areas of public policy. The CINDI programme has numerous opportunities to work with various partners on advocacy approaches and to review the impact of their national and local policies on health.

Marketing and organizational development

Political and collaborative support is essential for a long-term preventive programme. Finding ways to gain such support at the national and local levels is one of the principal challenges. In marketing the CINDI concept to key decision-makers, it is important to make several points:

- NCD prevention can achieve major health gains
- primary prevention will save resources
- modest additional funding can secure considerable progress.

The people involved in a CINDI programme need to make scientists and health practitioners aware of their role in educating decision-makers in the public and private sectors at the international, national and local levels about their opportunities to improve the population's health and quality of life.

Experience from the CINDI programme shows that formal, top-down approaches to policy should often give way to the use of informal, networking approaches. The use of networks offers several advantages: it facilitates the flow of information; it ensures that decision-making is

decentralized; it emphasizes results rather than process, and it allows leadership to emerge in response to the requirements of the situation.

The emergence of free-market economies in the CCEE and NIS provides a unique opportunity for the creation of strong alliances between the public and private sectors. The experience of the CINDI programme in marketing and organizational development can contribute to the application of knowledge on NCD prevention.

Public education and the mass media

The public needs to know what action can be taken to prevent NCDs. Lifestyle change, advocacy, community empowerment and the creation of healthy environments require that the public and key decision-makers are well informed about the potential value of prevention.

A better understanding is needed of how different target groups perceive health issues and of the best ways to reach various audiences, since all do not respond to a health message in the same way. In areas such as smoking and nutrition, better results are likely where messages are designed for and delivered to clearly defined target groups. It is also important not only to communicate health information but also to teach practical skills for change, to provide social support, to promote environmental changes and to introduce prevention and health promotion on the general agenda.

In the CINDI programme, health education is conducted on a one-to-one basis, in small groups, and through population-wide approaches. NCD prevention messages, such as an antismoking campaign in the mass media, originate with government, the voluntary sector, business, or a combination of all three. Some CINDI member countries, such as the United Kingdom (Northern Ireland) and Canada (Nova Scotia), are using social marketing techniques to promote heart health through lifestyle change. Social marketing can positively motivate people, and help to create a supportive social environment for desired changes.

The implementation and evaluation of health education initiatives include working with the mass media, as well as with schools and workplaces. The CINDI programme could use joint workshops to share experience in social marketing, conducting needs assessment, mobilizing communities and training community workers to support public education initiatives.

Guidelines for practice

An important part of CINDI intervention is to integrate and strengthen preventive practices in various health care settings. The development of national practice guidelines contributes to this. Member countries have national guidelines, such as those for the identification, evaluation and management of high blood pressure, elevated blood lipid levels and certain types of cancer. Guidelines should also be used for professional education, and can facilitate the more efficient use of health care resources.

The CINDI programme should help to facilitate the development and implementation of guidelines on NCD prevention. This would mean setting priorities for guideline development, agreeing on a process to review the scientific evidence and devising a joint strategy to have physicians and other health professionals incorporate the guidelines into their practice. CINDI demonstration programmes can test and develop such guidelines for national use.

Professional education and involvement

Physicians and, in some countries, nurses are well placed to prevent disease and to promote and foster behaviour and lifestyle change. Education programmes for physicians, nurses and other health personnel should emphasize the influence of these professionals as role models for behaviour change by patients.

Health professionals need training in communication and counselling, group dynamics, motivation towards making positive lifestyle change, and teamwork. The adoption of integrated approaches implies that training ought to focus more on the community, and give more emphasis to multidisciplinary teamwork. Nurses in several CINDI member countries are ready to take on an expanded role in health promotion and NCD prevention.

There are three main channels for enhancing the preventive practice of health professionals:

- undergraduate training
- postgraduate training
- continuing education.

CINDI member countries have a great potential to cooperate on professional education. They could work together to develop resources and materials and organize workshops to “train the trainers” in prevention.

4

Evaluation and monitoring

The functions of monitoring and evaluation are: to assess the extent to which a programme has attained its objectives, and to assess the process of the programme's development and performance. Thus, the CINDI programme is based on relevant scientific methods for process and outcome evaluation, and uses appropriate existing data sources and special CINDI data collections to carry out these functions.

CINDI national and demonstration programme activities are monitored and evaluated, to compare indicators and trends in the demonstration areas with those in the whole countries. The indicators for the development of CINDI on these two levels can be different and sometimes specific only to one, such as legislation for the national level.

A central aim in CINDI evaluation is to compare trends in different member countries and demonstration areas, with different background situations and experiences of intervention. To ensure comparability between programme areas, which permits comparisons of trends, the methods for assessment must be based upon carefully standardized criteria.

Indicators and data sources

The indicators to be monitored refer both to process and outcome evaluation and are grouped as:

- essential, or mandatory for participation in the programme; and

- recommended, or of considerable importance to the programme, (countries unable to provide information on these indicators should have special reasons).

The essential indicators cover the minimum database for the international CINDI data analyses.

Accurate measurements and standardization procedures are needed for the essential indicators. The quality of the recommended indicators should be at the same high level as the essential ones, and standardized procedures should be used. The information on the indicators should be collected from official and other published statistics and special population surveys.

Essential indicators

The essential indicators for a country and a demonstration area comprise:

- age and sex structure of the population (country and demonstration area);
- mortality data (country and demonstration area);
- food consumption data from the Food and Agriculture Organization of the United Nations (FAO) (country);
- survey data on outcome (demonstration area); and
- survey data on process (demonstration area).

Attempts should be made to ensure that the survey data reflect national trends, especially those concerning risk factors.

Age, sex and mortality

The age and sex structure of the total population in the country and the demonstration area must be reported. The mortality data to be used cover the whole country and the demonstration area. Mortality data will be reported according to the relevant codes of the International

Classification of Diseases (ICD) and with a subgrouping according to the Basic Tabulation List (B-list) of the ICD.

Food consumption data

The essential indicators of dietary change in the CINDI programme are average national food consumption figures. These figures are published in food balance sheets that are compiled on the national level every year, and published in a standardized way as three-year averages by FAO, and the Organisation for Economic Co-operation and Development (OECD) in Europe.

Food balance sheets are statistics based on figures provided by government agencies that document imported food and food produced by the agricultural industry, and estimate the amount of food grown by individuals. These statistics measure the quantities of food available for consumption, but not necessarily the amounts actually consumed. The values are expressed on a per caput basis. The information is given as the average consumption of about 50 foods per country. Intake levels of energy, protein, fat, calcium, iron, retinol, betacarotene, thiamine, riboflavin, niacin and ascorbic acid have been derived with the use of food composition tables from the Federal Republic of Germany and the United States of America.

Certain assumptions about food commodities are made in a standardized fashion, such as those about the fat content of meat, the level of waste and the food used for pets.

Food balance sheets do not give any indication of the differences in diet that may exist between population groups, such as different socioeconomic groups and residents of different regions in a country. They show national trends in food consumption and major structural changes in the dietary pattern of the whole country. Since the quality of the food balance sheets varies between countries, they should be used in intercountry comparisons only for comparisons of trends.

At the nutrient level, national food balance sheets do not necessarily give data identical to those published by FAO. The differences found, especially in the fat intake values, are evidently due to the different conversion factors used in the calculations. National calculations are thought to be more accurate, and they are recommended for use.

Survey data

The essential survey indicators are:

(a) biological factors:

- total cholesterol
- systolic/diastolic blood pressure
- body weight
- body height;

(b) behavioural factors:

- smoking
- alcohol consumption
- physical activity;

(c) educational level:

- total years of school.

Total cholesterol is the essential parameter to be measured in blood samples. For total cholesterol determination, standardization and internal and external quality control procedures are obligatory.

Systolic and phase-5 diastolic blood pressure have to be measured with a mercury manometer. The measurement of blood pressure (BP) should be as precise as possible. The necessary procedures for training staff should be the same in every survey: this is essential for valid comparisons. Further, a strict order of doing BP measurement should be kept as a fixed routine. The procedure is outlined in Annex 3.

Smoking questionnaire I (see Annex 4) is essential to determine smoking habits. The procedures in Annex 5 should be followed to measure height

and weight. The questionnaire and instructions in Annex 6 should be followed to determine alcohol consumption.

The goal of measuring physical activity as an essential indicator in the survey is to measure the parts of activity that can be influenced by the intervention. The questionnaire, being an essential part of the survey, should be usable for every country. As a result, some items have to be ignored that are of real importance in this context, because they have to be related to country-specific characteristics. In addition, it is recommended to use other, optional indicators. The questionnaire on physical activity is included in Annex 7.

Recommended indicators

The recommended indicators refer to a demonstration area and concern:

- morbidity
- other survey data.

Morbidity data

Morbidity data are recommended for:

- ischaemic heart disease
- cerebrovascular stroke
- diabetes mellitus
- cancer
- chronic respiratory diseases
- traffic accidents.

Morbidity analysis is an easily understandable concept, but data are, in general, hard to come by, and their accumulation differs considerably between countries. A certain set of disease indicators however, is considered feasible. Morbidity data can be compiled from official reporting systems, scientific registers and special surveys undertaken for the CINDI programme. It is important to emphasize that the main intention of the evaluation is to look at trends within a country, not to compare rates between countries.

The items to be included in morbidity evaluation comprise:

(a) CVD:

- ischaemic heart disease
- cerebrovascular stroke;

(b) cancer:

- of the gastrointestinal system
- of the stomach
- of the colon and rectum
- of the lung and larynx
- of the cervix
- of the breast
- of the prostate;

(c) diabetes mellitus:

- insulin-dependent
- non-insulin-dependent;

(d) chronic respiratory disorders;

(e) accidents:

- domestic
- traffic
- occupational.

The evaluation is concerned with all CVD registered in the area, implying that only events involving medical services are recorded. The information concerning non-fatal events must be collected from hospital and outpatient clinic records. If population samples are to be examined, additional information on point prevalence may also be gained, depending on the sample size. To qualify as an event for this register:

- the subject must be a resident of the programme area or country;
- the event must have had its onset more than 28 days after any preceding recorded coronary event in the subject; and

- the event must satisfy the criteria for the diagnosis according to the WHO definition.

No diagnostic criteria are required for the diagnosis of diabetes mellitus. The false cases thereby introduced are most probably non-insulin-dependent, but the error is at least partly random and considered acceptable. Possible sources of data are:

- hospital admissions or discharge records
- outpatient clinic records
- general practitioners' records
- sample surveys.

The information on cancer is most easily extracted from the national cancer register, where such a register is established and functioning. Both fatal and non-fatal cancers are recorded, thereby providing a basis for incidence rates. Specific diagnostic criteria are not required, but information concerning the use of diagnostic procedures and the stage of cancer are noted. Possible sources of data are:

- cancer registers
- records of hospital admissions or discharges.

Accidents in general are not recorded in all the areas and countries, but registers for occupational and traffic accidents are usually available. Such registers are run for monitoring purposes, as well as the identification of high-risk situations or occupations. Some of the countries are part of the Accident Prevention Programme. In this programme a forum of investigators will meet every second year. CINDI programme managers are requested to extract the information from this programme to monitor the accidents in the demonstration areas. Sources for information would therefore include:

- traffic and occupational accident registers
- domestic accidents, sample surveys
- the Accident Prevention Programme when feasible.

Other survey data

The following biological factors are recommended for inclusion:

- high-density lipoprotein (HDL) cholesterol
- serum glucose
- gamma glutamyl-transferase
- serum thiocyanate, cotinine, or other measure to validate self-reported smoking.

There will be no obligatory standards for parameters other than those mentioned in Chapter 3. The centres will therefore have to describe their methods in detail for other options. Procedures must be standardized within one centre so that they are consistent during the run of the programme. This includes:

- fasting or non-fasting status of subjects
- sample collection procedures
- preparation and storage procedures
- calibration methods
- analytic methods
- internal quality control procedures.

To monitor changes in dietary habits in a CINDI demonstration area, a food-frequency-type questionnaire is recommended for use in surveys. Since food habits, the availability of foodstuffs and food composition vary widely from one country to another, it is impossible to standardize the questions. Nevertheless, they should be designed to attempt to cover the main sources of fat, sugar, fibre and salt in the local diet. The proposed method is based on standardized definitions of generic foods from which the major food components of interest may be derived. Annex 8 gives instructions for designing the local questionnaire, along with some model questions.

The sample questionnaire, recommended for disability assessment is in Annex 9.

Implementing a risk factor survey

The risk factor survey is meant particularly to monitor levels and changes in biological and behavioural risk factors.

Sample size

To meet the minimum statistical requirements for detectable changes in risk factors in the population, at least 200 subjects have to be examined in each of the sex and age groups listed in Table 1. This calculation is based on the following assumptions:

- significance level ($\alpha = 0.05$)
- power of test ($\beta = 0.20$)
- two-sided test of hypothesis
- sample selection by simple random procedure
- independent samples at each survey
- defined changes in risk factor levels (cholesterol, blood pressure and smoking habits).

Table 1. Minimum sample size of a population survey

Age (years)	Males	Females
15–24	200, if possible	200, if possible
25–34	200	200
35–44	200	200
45–54	200	200
55–65	200	200
Total	800 (or 1000)	800 (or 1000)
Grand total	1600 (or 2000)	

There are four main reasons to adjust the size when drawing the sample:

- the expected participation rate is less than 100% (such as 65–75%);
- other sampling procedures are used than simple random sampling;
- the expected prevalence (or mean values for relative changes) and/or variance are greater than assumed in Annex 10; and
- other risk factors are to be measured and/or smaller changes are to be detected than those in Annex 10.

Each centre should estimate the expected participation on the basis of previous experience or a pilot study, and enlarge the sample size in proportion.

Two points should be kept in mind. First, in general, a lower participation rate may be expected in younger people, and in men. Second, the self-selection resulting from low participation rates may introduce biases in the estimate of means and rates.

Similar calculations as in Annex 10 should be made for any other risk factors studied as a local option, taking into account the prevalence levels in the population, the interperson standard deviation and the minimum absolute or relative change that is of biological significance. The same holds true for expected prevalence and variance values greater than those in Annex 10, and for defining changes smaller than those fixed in the calculations of Annex 10.

Sample selection

The study population for each centre should consist of people who reside chiefly in the study area (later referred to as residents). The study area should be defined geographically to correspond with administrative and census boundaries. The decennial censuses should be used to provide the age and sex breakdown of the population. These figures should be revised to give the best available estimates of the midyear (30 June) population size and structure for each year of the study. This is essential for any sex- and age-specific analysis within the overall monitoring and evaluation. It is possible that the later census results could be employed to validate the

estimates retrospectively, as inaccurate population estimates could account for spurious trends in mortality and morbidity rates, for example.

The population from which the sample is drawn should be as residents at this particular point in time. The samples must be independent ones in the run of the programme: that is, at each point in time when a sample is drawn, every resident should have the same chance of being selected. This is normally achieved by simple randomizing procedures using actual population registers as sampling frames. One way to simplify the procedure may be to use cluster sampling (such as households, villages, etc.). Other sampling procedures must be checked very carefully to ensure that every sampling unit has the same chance of being selected. Other sampling frames than population registers can include:

- electoral registers
- taxation registers
- post office or commercial registers
- households.

Local considerations will determine the method of obtaining the population sample, but the objective is to obtain a random sample of residents rather than samples of convenience, chunk samples, occupational groups, etc. Since the local characteristics of the population may be extremely variable, no universally applicable rules can be given, but only general guidelines.

The ideal solution is a pure sample: a sample drawn directly from the defined sample frame. In practice such a sample will cause logistical problems, because most of the study populations will be more or less scattered. This will hold true even for a geographically stratified sample including sex and age. Other additional strata could be con-sidered (in terms of qualitative characteristics). These may be: industrial–urban, rural–urban, seaside–plain–hills–mountains or other sociodemographic or geographically defined qualities. If an adminis-trative population register can be used, a stratified population sample is recommended. Demographic, economic, cultural and other characteristics are normally

related much more to population density than to the size of administrative units. The administrative units should be ranked according to population density, and qualitatively described classes of density should also be defined for each stratum. Out of such a class units can be randomly selected, and from these units samples can be drawn in the sex and age strata accor-ding to the proportion this density class comprises in the overall population (proportional method). Usually, cluster sampling may be a reasonable compromise with respect to logistical conditions, but the number of subjects must be increased (usually by one third to one half).

The broad approach of the CINDI programme requires a lot of effort to ensure heterogeneity in population characteristics, and, on the other hand, to define selection criteria that can be kept fixed for the follow-up screenings. Using the strata population density could be a simple approach to ensure both. Changing the criteria may pose serious problems in trend analysis. In any case centres should consult a sampling statistician, and the methods should be discussed with the CINDI Data Management Centre in Walldorf, Germany.

The calculation of 200 subjects in each sex and age class is based on the minimum statistical requirements. The size of a representative sample depends on the selection criteria that are chosen to ensure heterogeneity in population characteristics. Although there is no common rule, it is recommended that the size should be tripled (that is, 600 subjects in each sex and age group). This is equivalent to introducing a third stratum with three qualitative categories (such as three classes of population density).

It is recommended that the survey of population risk factors take place at the beginning of the CINDI programme, and thereafter every fifth year (see also Chapter 3). Wherever possible, the time schedule should be synchronized with the surveys of the WHO project on monitoring of trends and determinants in cardiovascular disease (MONICA). In any case the surveys should be repeated over the same time period of the year to minimize the effect of seasonal bias. The weekdays of investigation within a survey should also be considered, owing to the possible influence of behavioural factors, such as nutrition.

Process evaluation

Process evaluation is performed in the area of the demonstration programme, and can be carried out at the national level. Information on programme implementation, exposure to intervention and the process of changing health behaviour and risk factors is obtained from survey data, annual progress reports and site visits.

Process evaluation survey

The CINDI member countries will carry out an annual process evaluation survey in the area of the demonstration programme. The core questionnaire including the essential questions is in Annex 10. The sample should be representative of the population, and number not less than 800 (400 males and 400 females). Surveys should be carried out at the same period each year. The data are to be sent to the Data Management Centre as soon as possible, but not later than one year after the survey.

In addition to the annual surveys, questions on process (both those given in Annex 10 and others according to local needs) may be included in the population risk factor surveys.

Annual report

The member countries will collect data on relevant activities of their programmes. A log of activities can be used as a tool for collecting information on programme implementation. This information is used for the annual reports that are to be sent to the WHO Regional Office for Europe and the Data Management Centre before the end of March. The annual reports include information from the programme area and the national level. The issues to be discussed are: the programme's objectives, administration and management, monitoring, surveys and data collection, intervention activities, resources and financing, and reports and publications. Annex 11 gives the reporting format.

Site visit

Site visits are tools for external evaluation of the programmes and their performance. A site visit is carried out when a new country applies for membership in CINDI. Other site visits are agreed between the Management Committee and the member countries. Annex 12 contains the check-list for site visits.

Data management

Data collection format

Only the data collection format (such as the coding of the questionnaire, measurement units, etc.) is described here; the data transfer format is discussed in Annex 13. In this section only essential indicators are included.

Sex and age distribution

Crude numbers should be reported rather than relative frequency. The crude numbers should be broken down by sex and age. One-year age classes, starting with 0 years of age, are recommended. If this is not possible, at least five-year age classes should be used, starting with the class aged 0–4 years and ending with that aged 75 and over. Furthermore, the numbers should be broken down as far as possible by geographical regions within the study areas, to ensure a more specific analysis.

Mortality data

Crude numbers should be reported, rather than rates (such as events per 100 000 population). The breakdowns must be the same as above. Each reported number has to be identifiable by its code on the B-list of ICD (three digits), sex, and age, and other optional breakdowns. Numbers for classes of diseases (such as diseases of the circulatory system) and numbers for selected specific causes (such as myocardial infarction) must be reported separately.

Areas that participate with the whole country in the CINDI programme do not have to report mortality data, as they will be received directly from the WHO headquarters.

Food balance sheets

Areas that participate with the whole country and do not use national calculations do not have to report food balance sheet data, as they will be received directly from FAO. If data from national food balance sheets are reported, and national food composition tables are used, the same reporting format should be used as that in the FAO food balance sheets.

Some countries may wish to add more detail on fat quality (saturated fats, some polyunsaturated fats) or important micronutrients, for example, when this is available, based on local food composition tables (which may differ from those used by FAO).

Survey data

The measurements should be reported as follows:

- serum cholesterol: 3 digits for values recorded in mg/dl, 3 digits (the last digit for decimals) for values recorded in mmol/litre;
- blood pressure: the correct reading of systolic and diastolic BP (see Annex 3), with 3 digits for values recorded in mmHg;
- smoking habits (see Annex 4);
- height: 3 digits for values recorded in cm (see also Annex 5);
- weight: 4 digits, with the last digit as decimal, for values recorded in kg (see also Annex 5);
- alcohol consumption and physical activity (see Annexes 6 and 7).

In addition, the recording format of the MONICA project may be used.

The data collection format for recommended and/or optional indicators has to be fixed according to the specific data sources and types of information, by the countries themselves.

Schedules

Surveys of risk factors in the population should take place at the beginning of the CINDI programme and every five years thereafter. The results should be reported within the year following the conclusion of the examinations. Mortality data must be analysed for the preceding years as well to assess developments in trends. The same holds true for recommended indicators (such as morbidity). Thus, it is recommended to report such data to the extent possible.

Other data should be reported and analysed at intervals of at least two years, starting in 1986, to enable appropriate data analysis within the combined monitoring and evaluation procedures. It is recommended, however, that the data also be analysed ad hoc in the participating centres, in order to assess progress in the programme according to country-specific needs.

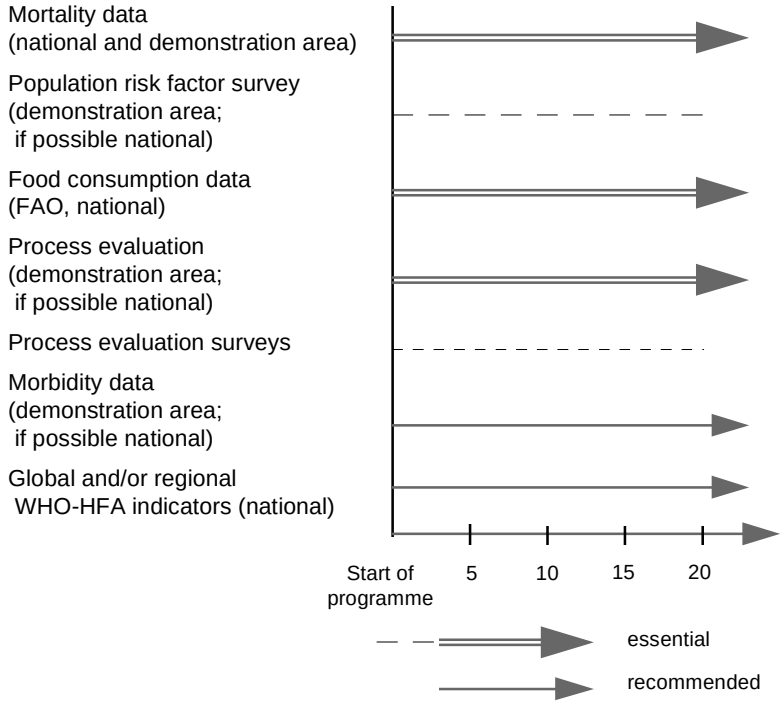
To share work and thereby to increase the effectiveness of the combined monitoring and evaluation in the programme, it is proposed to process and analyse the data separately. It is assumed that the Data Management Centre will process the data in a common database and provide the data to the programme directors and the Coordinating Centre for further analysis. It is assumed that the Coordinating Centre will organize the overall data exchange, make the requests for data to the Data Management Centre and be responsible for the combined interpretation and final presentation of the results.

In general, it is recommended to make as much use as possible of existing data sources within the countries and in European databases. The existing WHO reporting system for progress towards health for all could provide data on its global and/or regional indicators.

This holds true at least for the CINDI members that are extending the programme throughout the whole country. The countries participating through smaller regions or pilot areas should make efforts to report the data for their study areas. The participating countries must report the data

from the population surveys (individual records) directly to the Data Management Centre.

Fig. 1. Scheme of evaluation and monitoring



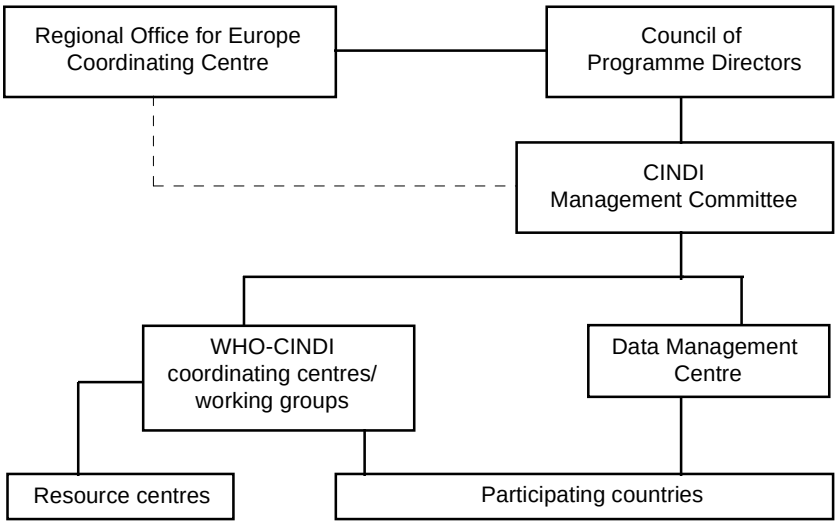
5

Organization and management

The international CINDI programme has the following policy and management organs (Fig. 2):

- the WHO Regional Office for Europe
- member countries with collaborating centres
- the Council of Programme Directors
- the CINDI Management Committee
- the Data Management Centre
- CINDI working groups
- CINDI resource centres.

Fig. 2. CINDI organizational chart



WHO Regional Office for Europe

The WHO Regional Office for Europe, in Copenhagen, will:

- act as the CINDI programme coordinating centre, providing the technical coordination of the core project;
- organize the meetings of the Council of Programme Directors;
- communicate closely with the CINDI Management Committee and the Data Management Centre and agree on the division of responsibilities with them;
- help to formulate approaches to funding bodies;
- arrange the recruitment of consultants when required; and
- keep detailed records of membership of CINDI, lists of collaborating centre team members, copies of manuals etc.

The Regional Office, subject to its budgetary limitations, will:

- designate a programme coordinator who will ensure the implementation of all activities on the international level on behalf of WHO and the health ministries of participating countries;
- arrange for the provision of technical support by other WHO staff; and
- provide such technical advice and guidance as may be required for the successful execution of the programme.

CINDI member countries with collaborating centres

The CINDI member countries and their collaborating centres should follow the protocol and guidelines of the CINDI programme. Collaborating centres should provide the WHO Regional Office for Europe and the Data Management Centre with data in the format required in accordance with the agreed timetable. They should provide the Regional Office with annual progress reports for review before the Council of Programme Directors meets. They should accept periodic visits from groups of experts sent by the Regional Office to review their data and procedures. The collaborating centres have access to the central CINDI database.

CINDI Council of Programme Directors

The Council is composed of the designated Programme Directors. It is the highest policy- and decision-making body for the cooperative CINDI programme.

Each of the countries participating in CINDI has an overall country programme and a responsible programme director. He or she is the country coordinator and in charge of the overall programme in the country. He or she may also be the programme manager, responsible for administration and general programme management, and/or the principal investigator, responsible for the scientific evaluation of and other research on CINDI in the country. Meetings of the Council of Programme

Directors are held as often as funding permits, but not more frequently than annually or less frequently than every two years. Participants at these meetings include:

- programme directors or their representatives;
- representatives of the Regional Office for Europe and WHO headquarters, the head of the Data Management Centre and the CINDI newsletter editor; and
- other people as necessary.

Programme directors, one per country, two Regional Office representatives and one representative of WHO headquarters and the head of the Data Management Centre have the right to vote.

CINDI Management Committee

The Management Committee includes:

- three programme directors on a rotating basis from the countries that had hosted or would host a meeting of the Council of Programme Directors (if these do not include a representative of the CCEE or NIS, one from these areas should be included);
- one representative from the Data Management Centre; and
- three representatives from WHO (two from the Regional Office for Europe, one from headquarters).

The Chairperson, serving for two years, could be chosen either from among existing members of the Committee or from among other programme directors with the necessary experience and resources. The term of office of the rotating programme directors will be three years.

Meetings of the CINDI Management Committee will be held when the need arises. The Committee has the following responsibilities:

- to propose changes to the protocol and manuals, and to plan data format, transmission etc., which should be approved by the Council of Programme Directors;
- to institute and monitor measures for quality control that will be managed by the Data Management Centre;
- to assist WHO in the management and administration of the programme; and
- to advise the Council of Programme Directors on the suitability of proposed CINDI collaborating and resource centres.

CINDI Data Management Centre

The Data Management Centre is concerned with the management of the core data of the CINDI programme and, in this respect, responsible for the handling of the data transfer, the completeness and quality of data files, their processing and their presentation on request. In close cooperation with the CINDI Management Committee and the Regional Office, the CINDI Data Management Centre will:

- prepare methodology and instruments for data collection for the CINDI programme;
- receive core study data from the CINDI member countries in a commonly agreed format, and ensure their security and confidentiality;
- present a report on the completeness and quality of core data files to each meeting of the Council of Programme Directors;
- provide analyses and reports of the CINDI core data in a format decided and approved by the Regional Office;
- help to develop and implement appropriate quality assurance;
- advise CINDI member countries on data collection and management procedure;

- prepare core data files for shared analysis and participate in shared data analysis;
- help to prepare publications of the results of the CINDI programme;
- report to the Council of Programme Directors and the Management Committee whenever necessary; and
- collaborate closely with the Regional Office on the management of the CINDI programme.

CINDI resource centres

The Council of Programme Directors appoints resource centres to assist in the international collaboration in designated fields of activity. The resource centres report to the coordinating centre and to the Management Committee.

Membership

Membership in CINDI is open to all countries in the WHO European Region that want to join and will follow the protocol. Countries outside the Region that would benefit from membership can also join the programme.

Perspective members should apply to the WHO Regional Office for Europe. A prerequisite for acceptance is the country's willingness and ability to follow the CINDI protocol and to comply with the requirements for membership. The application should provide evidence of previous experience in NCD prevention and skills for carrying out the work of CINDI and plans for implementing CINDI in the country.

After receiving the application, the Regional Office will arrange, in consultation with members of the CINDI Management Committee, a site visit to the country. Afterwards the Management Committee will review the application and refer it to the Council of Programme Directors for a

decision. In case of a positive decision by the Council, the Regional Office will sign the formal agreement with the health ministry of the country concerned.

Member countries must continue to follow the protocol and agreed procedures. In case of major and sustained deviance from the protocol, the Council of Programme Directors, following a proposal by the Management Committee, may terminate the membership.

If the national health ministry is not ready to sign an agreement with the Regional Office, the country may nevertheless participate as an associate member if the other "entrance requirements" are met, and there is ministerial agreement. Essentially this means a trial period to consider full membership.

Publication policy

Collaborating centres are encouraged to publish their data, alone or in partnership. Joint publications using the central CINDI database should be approved by the programme directors. Papers or other publications central to the programme will be published under the authorship of the "WHO-CINDI Collaborative Group".

The participating countries and the CINDI Council of Programme Directors should be mentioned. The person(s) who prepared the publication should be given credit as co-author(s) or editor(s). When appropriate, other key personnel from collaborating centres should also be listed in the publication.

CINDI Newsletter

A key means of information exchange is the regularly published CINDI newsletter. The Council of Programme Directors appoints the editor, who

reports to the WHO Regional Office for Europe and the CINDI Management Committee.

Annex 1

Activities in Various Sectors and at Different Levels

The health ministry

1. A national plan should be produced in conformity with the targets and objectives of the programme.
2. Consideration should be given to securing relevant existing information for monitoring and evaluating the programme; information from and meetings and discussions with all groups of health professionals are needed.
3. Provision should be made for reviewing the curricula for training health professionals, especially physicians and nurses, and the implementation of postgraduate courses in the country.
4. The primary health care system should be re-examined with a view to incorporating the programme activities in the day-to-day tasks of health personnel.
5. Press releases should be issued and media resources developed, including television programmes.
6. A national conference should be convened, as well as meetings in the health areas with participation of all the different groups in the programmes.
7. Guidelines should be issued to hospitals on ways in which they can demonstrate healthy habits, such as healthy food and nonsmoking.

The agriculture ministry

1. There should be a continuous effort to stimulate the production and consumption of healthy foods.
2. Action should be taken to develop labelling and to provide statistics on the consumption of agricultural products.

The education ministry

1. Information about health should be a part of the curricula of all kindergartens and schools.
2. Efforts should be made to modify the curricula for the training of health and social service personnel so as to orient them towards prevention.
3. Special attention should be paid to children of all ages.
4. Special courses should be organized for parents, on the subject of schoolchildren's health behaviour and needs.

The finance ministry

1. The main task in this connection is to review the fiscal policies related to health in its widest sense, including the provision for:
   - taxes on harmful products such as tobacco and alcohol
   - subsidies on all beneficial foodstuffs.

The transport ministry

1. Education focusing on accident prevention should be highlighted.
2. Legislation on factors that can influence health-promoting behaviour, such as road design and seat-belts, should be introduced.

Other ministries

Other ministries would include those responsible for the environment, labour, housing, social affairs, consumer affairs, etc.

1. Safety at the workplace should be an important focus of coordination between ministries.
2. Legislation on clean air will have to be adopted in most countries.
3. Attention must be paid to safety in housing, playgrounds, the home, and sports and leisure activities.

Other institutions

1. It is crucial for the implementation of the programme to develop genuine and lasting contacts with the *mass media*, especially television and radio, in order to get information on the programme to the public, particularly information on its progress and achievements.
2. The *trade unions* in many countries are strong links between the people and the government; therefore it is very important to use this connection to aid the programme by:
   - influencing workers' behaviour;
   - persuading the government to introduce legislation on safety in the workplace;
   - influencing government policy that affects the health of workers and their families; and
   - influencing employers and managers to allow all preventive measures to be taken during working hours.
3. The secretariat may find it wise to involve *other groups* in the work, such as the Red Cross, churches and sporting clubs; this approach will give a broader front to the whole undertaking, and can be highly recommended.

Annex 2

Format of National Protocol

General country information

General country information would include:

- geography, climate, history;
- demography (age and sex distribution and growth rate with trends, especially in respect of migration);
- occupation (main occupations and the distribution of the working population, and the degree of unemployment);
- education (educational and legislation system); and
- socioeconomic situation (political and economic situation and system, consumption of tobacco and alcoholic beverages, and income to the state from taxation as a percentage of the total state income).

Information on health status

Information on health status in the country would cover:

(a) health administration and planning:

- administrative structure of the country and the ministries, especially the ministry of health and related ministries;
- health legislation, policies and plans;

(b) the health situation:

- life expectancy at birth and at different ages;
- crude birth rate and trend over 5–10 years;
- crude death rate and trend over 5–10 years;
- maternal mortality rate;
- infant mortality rate and ten-year trend;
- mortality from NCDs, including cancer, cardiovascular diseases, accidents, stroke and diabetes for the population of 0–70 years in ten-year groups;
- general mortality pattern over 10 years;
- morbidity pattern:
  - communicable diseases;
  - NCDs;
  - occupational diseases;
- premature deaths from noncommunicable diseases;

(c) health services organization; and

(d) organization of health care and health-related systems, and more detailed information about special screening and detection programmes.

Aim and objectives

For the aim and objectives of the programme, see Chapter 2.

Strategy for prevention

The guiding principle of the strategy for prevention should be to work through the existing preventive structures of the health and related services in the country and to enhance them where necessary. The risk

factors should be controlled simultaneously. The primary health care system has a valuable part to play and should be included in the strategy at an early stage.

Responsibility

The responsibility for the programme lies with the health ministry. To achieve the objectives, it is necessary to draw up national guidelines for the development of the programme and to establish an appropriate structure in which it can be implemented.

Organizational structure

The programme's organizational structure would include the following.

A *coordinating council* is a normal and effective way to facilitate the task of the ministry in coordinating the work of the different interest groups in the country. Members of the council should come from ministries such as those responsible for finance, agriculture, environment, education, social affairs, transport and consumer affairs; from organizations such as the cancer union, the heart society, the Red Cross and the trade unions; and from the mass media (newspapers, radio, television). The council should be chaired by a high official of the Ministry. The council should have at least the following tasks:

- advising ministries on policies concerning all health aspects of the programme;
- advising ministries on the broad objectives of the programme;
- coordinating all major activities relating to the programme both within and among different services and groups.

A national *programme director* should be appointed to supervise the implementation of the policies, objectives and targets of the prog-ramme. He or she can also be the principal investigator. The prog-ramme director should be the main contact person for liaison with the Regional Office

and with the other member countries taking part in the programme. The main tasks of the programme director should be:

- to draw up a detailed plan of action in conformity with the agreed overall policies, objectives and targets of the programme;
- to supervise the implementation of the programme and ensure that the activities of institutions and groups in various sectors and at different levels, are properly coordinated (see Annex 1).

Annex 3

Blood Pressure Measurement

1. The subject should be instructed to avoid the following activities for at least one hour before the blood pressure measurement: strenuous exercise, eating, drinking of anything other than water, smoking, drugs that affect BP. In addition, a full bladder affects BP and the subject should be advised accordingly.
2. The subject should have removed outer garments, jackets, etc. The sleeve of his or her shirt or blouse should be rolled up so that the upper right arm is bare for the BP cuff. The sleeve should not constrict, and the BP cuff should not be over the garment. Garments must be removed if obstructing and a short-sleeved jacket provided.
3. The examination should take place in a quiet room with controlled temperature.
4. The equipment used should preferably be the mercury sphygmomanometer. The cuff (bladder-size) should be 12–12.5 cm wide, sufficiently to cover at least 2/3 of the upper arm.
5. BP should be measured after resting with no change of position for at least 5 minutes, in sitting position and using the right arm, unless there is a deformity. When seated, the subject's arm should be allowed to rest on a desk so that the antecubital fossa is level with the heart. To achieve this, either the position of the subject in the chair should be adjusted, or the arm may be raised or lowered on a comfortable support. The subject must always feel comfortable.

6. The cuff should be applied firmly enough to prevent slipping. The rubber tubes should lie symmetrically on each side of the cubital fossa (to have the central part of the rubber bladder covering the brachial artery). The lower edge of the cuff should be 2–3 cm above the cubital fossa, to allow sufficient room for the bell of the stethoscope. The top edge of the cuff should not be restricted by clothing.

7. The observer should be in a comfortable position in relation to the examination table. The sphygmomanometer's mercury column should be in a perfectly upright position, with its centre at the examiner's eye level. The mercury column should face the examiner and should not be in the subject's view. The cuff should now be connected with the sphygmomanometer. After the subject has rested 5 minutes in this position – during which the whole process of BP measurement could be explained to him or her – the peak inflation level should be established. This is the level to which the pressure should be raised for the first BP measurement. The examiner:

   (a) feels the subject's radial pulse with the fingers of the left hand;

   (b) inflates the cuff and notes the level of the top of the meniscus of the mercury column at the point when the radial pulse disappears;

   (c) immediately deflates the cuff by disconnecting it from the sphygmomanometer; and

   (d) writes down the level of the mercury column (where the ra-dial pulse disappeared) to the nearest 2 mm reading and adds 30 to this number (this sum is called the peak inflation level).

8. Then the examiner reconnects the cuff and the sphygmomanometer and waits for at least 30 seconds, or raises the subject's arm for 5–6 seconds. This is to allow the return of venous blood to the forearm. Afterwards, the examiner locates the subject's brachial pulse and places the bell of the stethoscope immediately below the cuff at the point of maximal pulsation. If it is not possible to feel the brachial pulse, the bell of the stethoscope should be placed over the area of the upper arm immediately inside the biceps muscle tendon. The bell

should not touch the cuff, rubber or clothing. Looking at the sphygmomanometer with the centre of the scale at eye level, and the column perfectly upright, the examiner inflates the cuff rapidly to a pressure equal to the peak inflation level. From this point, the examiner lets the column of mercury fall at a rate of 2 mmHg per second. The examiner continues to reduce the pressure steadily at this rate until recording the systolic and phase-5 diastolic level, and then rapidly deflates the cuff (as above). Blood pressure values should be recorded to the nearest 2 mmHg (reading from the top of the rounded meniscus). If the top of the meniscus falls halfway between two markings, the examiner should choose the higher one.

9. The examiner reconnects the cuff and the sphygmomanometer, raises the subject's arm for about 5–6 seconds or waits at least 30 seconds, and then repeats the measurement in exactly the same way as the first one was made. When the examiner has dif-ficulties in hearing the sound, the cuff must be completely de-flated and at least 30 seconds must pass before making the next measurement.

10. The examiner records the values of both measurements.

11. The above procedures for BP measurement should be applied regardless of the instrument used. Additional instructions apply for the random-zero machine. The examiner should:

    (a) connect the cuff tubing to the random-zero device;

    (b) ensure that the mercury reservoir valve is in the operating position (turned fully to the right and extending past the right side of the case) and turn the bellows cock on the face of the device to the right, to the position marked OPEN;

    (c) turn the thumb wheel at the right side of the device, by gently stroking it two times with the thumb of the right hand (if the wheel is not free to spin in either direction, the bellows are not completely deflated and the bellows check position should be rechecked);

    (d) inflate rapidly by the same method as for the standard device, to the peak inflation level for the series of random-zero readings;

(e) by closing the bulb thumb valve, hold the pressure at this level for five seconds (count to five slowly), and then turn the control valve to the left, to the position marked CLOSE;

(f) by carefully controlling the thumb valve, with the bell of the stethoscope over the brachial artery, deflate the cuff at 2 mmHg per second until the level is 4–6 mmHg below the diastolic reading;

(g) open the thumb valve fully and disconnect the tubing to the random-zero device, allowing the mercury to fall to its zero level for this reading;

(h) record the systolic and phase-5 diastolic readings, uncorrected; and

(i) read the zero level for this reading and record it on the form in the spaces provided beneath the uncorrected systolic and phase-5 diastolic readings; subtract the zero level to obtain the correct readings and record them on the form.

Annex 4

Smoking Habits

The following questionnaire can be self-administered if it accompanies the invitation to the examination sent to the homes of the people invited to participate in a survey; or it can be administered by a technician or nurse at the screening site. The same procedure, however, should be applied throughout the study in the same centre. In the case of self-administered procedures, the questionnaire should be reviewed by a technician or a nurse for completeness and consistency of answers. In the case of direct administration some general rules should be followed:

- the same wording as on the questionnaire should be used;
- if the subject does not answer or appears not to have understood on the first occasion, the questions should be repeated in the same form;
- if the subject again does not answer or understand, the questions should be asked the third time in different words, with the same meaning as the original questions;
- answers should be recorded and not interpreted;
- answers should not be influenced; and
- all questions should be asked and all answers recorded unless otherwise stated.

Interviewers should be trained and their performance evaluated and tested for precision and accuracy.

Smoking Questionnaire

1(a) Do you smoke cigarettes now?

Yes, regularly	1
No (go to question 2(a))	2
Occasionally (usually less than one cigarette/day)	3

1(b) On average, about how many cigarettes do you now smoke a day? (go to question 3) Number:....

2(a) Did you ever smoke cigarettes?

Yes, regularly	1
No, never (go to question (3a)	2
Occasionally (usually less than one cigarette/day)	3

2(b) When did you stop smoking cigarettes? Year: 19....
If in the last year:

less than 1 month ago	1
1–6 months ago	2
6–12 months ago	3

3(a) Have you ever smoked cigars, cigarillos or a pipe?

No	1
Used to, but not now	2
Now smoke occasionally (less than 1 per day)	3
Now smoking regularly	4

3(b) If regularly now, how many cigars, cigarillos or pipefuls a day? Number:...

Annex 5

Height/Weight

Height and weight are measured in conjunction.

Height

1. The height rule must be taped vertically to a hard flat surface, with no moulding, with the base at floor level. A carpenter's level should be used to assure vertical placement of the rule.
2. The floor surface must be hard (tile, cement, etc.), not carpeted or covered with other soft materials. If only a carpeted surface is available, a wood platform should be laid down to serve as the floor, and a mat or small carpet should be placed between the chair and the rule.
3. The examiner asks the subject to remove his or her shoes and heavy outer garments (jackets, coats, etc.).
4. The subject should stand, feet together, with his or her back to the height rule, with the back of the head, back, buttocks, calves and heels touching the wall. The top of the external auditory meatus (ear canal) should be level with the inferior margin of the bony orbit (cheekbone). This position is achieved by asking the subject to hold the head in a position where he or she can look straight at a spot, at eye level, on the opposite wall.
5. The examiner places the triangle on the height rule and slides it down to the head so that the subject's hair is pressed flat.

6. The examiner records the information on the survey form to the nearest centimetre. For example, 187.4 is recorded as 187; 187.5 as 188; 187.6 as 188.
7. Self-reported heights are not acceptable in ambulatory subjects and should be reported (marked as refusal). Only people who are not ambulatory (such as amputees) may report their height. The examiner should be sure to note such a case on the form.
8. To measure extreme heights, the examiner uses a short rule in addition, placing it at the top of the long rule and adding the extra height.

Weight

1. The floor surface on which the scale rests must be hard and must not be carpeted or covered with other soft materials. A mat or small carpet with non-skid backing should be placed between the chair and the scale.
2. The scale should be balanced with both weights at zero and the balance bar aligned.
3. The subject should remove his or her shoes and heavy outer garments (jackets, coat, etc.).
4. The subject should stand in the centre of the platform, as standing off centre may affect measurement.
5. The examiner moves the weights until the beam balances (the arrows are aligned).
6. The examiner reads the weight and records it on the form, to the nearest 200 g.
7. Under no circumstances is the subject to self-report his or her own weight or do the reading of the scales.
8. Self-reported weights are not acceptable in ambulatory persons. The examiner should record refusals to be weighed. Only subjects who are

not ambulatory (such as amputees) may report their own weight. The examiner should be sure to note this on the form.

Annex 6

Alcohol Questionnaire

Since the quantities used differ between countries, they should be modified accordingly. The individual counts of units should be reported for each person.

In reports of individual data to the Data Management Centre, the average alcohol content (in volume per cent) for every drink and the average fluid content (in dl) of the units used in the questionnaire should be specified. The Data Management Centre will compute the total alcohol consumption for every person. See Annex 4 for data collection procedures.

Alcohol questionnaire

How many glasses (restaurant portions) or bottles of the following have you drunk in the last seven days? (If you did not drink at all, answer 0.)

1. Beer	.....	bottles
2. Wine	.....	glasses
3. Spirits/liquor	.....	restaurant portions
4. If necessary, other country-specific drinks (in units as above)	.....	

Annex 7

Physical Activity

The examples given in questions 1 and 2 should be modified according to country specific characteristics. For data collection procedures, see Annex 4.

Physical Activity Questionnaire

1. How much physical activity do you have at work? (We have divided occupations into four groups. If you do not work, mention group 1. Mention only one group.)

   My work is mainly sitting work. I do not walk much at work. Examples: watch-maker, radio mechanic, industrial sewing work, office work at a desk. 1

   I walk in my work quite a lot but I do not have to lift or carry heavy things. Examples: shop assistant, light industrial work, office work where one has to move. 2

   I must walk and carry a lot or often climb stairs or go uphill in my work. (Examples: carpenter or farmhand, work in engine-shop, heavy industrial work.) 3

   My work is heavy physical work, where I have to carry or lift heavy things, to dig, to shovel or to cut a lot. (Examples: forestry work, heavy farm work, heavy construction and industrial work.) 4

2. How much physical activity do you have during your leisure-time? (If it varies with the seasons, mention the group that best represents the average of the year. Mention only one group.)

   In my leisure time I read, watch television and do things that do not require physical activity. 1

   In my leisure time I walk, ride a bicycle or move in other ways requiring physical activity for at least 4 hours a week.

This includes walking, fishing and hunting, lighter garden work and so on, but not going to and coming from work. 2

In my leisure time I have physical activities to maintain fitness, such as running, skiing, gymnastics, swimming, ball-games or doing heavy garden work or its equivalent. 3

In my leisure time I train regularly, several days a week, for competitions in running, orienteering, ball-games or other physically heavy sports. 4

3. How many times a week are you engaged in the activities you mentioned in answering question 2?

4. How many minutes a day do you spend walking, cycling or in any other physical activity on your way to work? (Include both the time spent going to and coming from work. Give only one answer.)

I don't work or get physical activity on the way to work	1
Less than 15 minutes a day	2
15–29 minutes a day	3
30–44 minutes a day	4
45–59 minutes a day	5
More than 1 hour a day	6

5. How often do you do physical activities lasting at least 20–30 minutes that make you short of breath and perspire? (Give only one answer.)

Daily	1
2–3 times a week	2
Once a week	3
2–3 times a month	4
A few times a year or less	5
I cannot because of disease or disability	6

6. How many times a week do you do such leisure physical activities that make you a little short of breath and perspire? (If not at all mark 0.) ..... times a week time

7. How long do your episodes of physical activity last?

Less than 15 minutes	1
15–29 minutes	2
30–59 minutes	3

One hour or longer	4

8. How do you consider your present physical condition? (Give only one answer.)

Very good	1
Reasonably good	2
Reasonable	3
Not very good	4
Very bad	5

9. Have you ever seriously tried to increase your leisure-time physical activity? If so, when was the last time? (Give only one answer.)

Never	1
More than 6 months ago	2
1–6 months ago	3
During the last month	4

10. Has your leisure-time physical activity increased during the last 6 months? (Give only one answer.)

Very much	1
A little	2
No change	3
Decreased a little	4
Decreased a lot	5

Annex 8

Dietary Surveillance

Background

This annex is based on the discussions and recommendations of two meetings: one in Copenhagen in 1985, and the other in Polvijarvi, Finland in 1988. It was decided that the only essential indicators of dietary changes were those provided by food balance sheets. Thus, the dietary section in the manual itself is very short. Dietary changes can and will be monitored in many different ways in each CINDI member country.

Objectives

The primary aim is to monitor changes in diet within countries against the stated objectives for dietary improvement (see Chapter 4). A secondary aim is the comparison of the changes in diet between countries. Four methods are discussed here:

1. monitoring of trends in food consumption at the national level (using FAO or national food balance sheets);
2. monitoring changes in dietary habits against stated objectives (using a food frequency questionnaire);
3. monitoring intakes on nutrient level (using food consumption records or 24-hour recall); and
4. monitoring changes in food formulation and production practices such as changes in food legislation, animal breeding, formulation of cooking fats and availability of new foods with reduced fat or salt content, etc. (using descriptive records: analysis of impact on diet based on food frequency data).

Reporting status

The first objective is considered the more important. The essential indicators for monitoring trends in food consumption are provided by the food balance sheets (see Chapter 4). Indicators for monitoring changes in diet are recommended. Since monitoring changes in nutrient intake levels in an area is desirable, it is recommended as an optional method that three-day food records on at least a subsample be collected in the five-year surveys.

While indicators for monitoring changes in food formulation and production practice should be measured as far as possible, this will be optional.

Food balance sheets

See Chapter 4 for a discussion of food balance sheets.

Dietary questionnaire

Owing to the wide variations in eating habits, the availability of foodstuffs and food composition, uniform reporting of specific foodstuffs across countries is impossible. Moreover, it would be meaningless. The proposed method is based on standardized definitions of generic foods from which the major food components of interest – fat, sugar, fibre, salt and calcium – may be derived. The following generic foods should be covered:

1. dairy products
2. fats and oils
3. meat
4. poultry
5. fish
6. eggs
7. cereals
8. fruit and berries

9. vegetables
10. pulses and nuts
11. cakes and pastries
12. sugars and sweets
13. salty snacks and table salt
14. beverages
15. coffee and tea.

Dairy products include foods such as milk, sour milk, cream, yoghurt, and ice-cream, and solid foods (cheeses). Fats and oils include butter, margarines, butter-oil mixtures, butter-water mixtures (new low-fat products), oil, lard, etc. Meat includes beef, pork, lamb and processed meat. Fish includes fresh and processed (salted, smoked, marinated and canned) fish. Cereals include bread, pasta, porridges, and processed cereals. The vegetable group covers potatoes, other roots and tubers, leafy green vegetables, etc. Sugars and sweets cover sugar used in coffee and tea, honey, jam, and artificial sweeteners. Salty snacks include salted nuts, potato chips, salty crackers, etc. and the use of table salt. Beverages mean fruit juices, soft drinks and water.

The food items to be included in the questionnaire should be selected on the basis of their importance as sources of fat, sugar, fibre, salt or calcium. A suggestion of ways to make this selection is presented in the following table. The individual food items differ widely from one country to another, but the reasons for their inclusions should be the same.

The individual questions can be qualitative, quantitative or frequency questions. Examples of qualitative questions are presented in the questionnaire below. Typically, questions about fat spread, milk, bread and fat used in cooking and baking are asked in qualitative terms. Some food items can be the subject of quantitative questions on, for example, the daily consumption of milk, bread, coffee, tea, eggs, sugar in coffee or tea, and potatoes in some areas. It is most important that the units used (slices, pieces, glasses or grams) are the same that people themselves use and easily understand. Some quantitative questions are included in the questionnaire below. Questions about most of the food items (such as meat, fish, vegetables, fruit, berries, cheese, soft drinks, cakes and

pastries, and cereals) are in terms of frequency. Since the frequency categories used can vary widely, it is suggested that the same categories be used as often as possible.

Food items to be covered in a dietary questionnaire

Generic foods	Type of food items	Type of questions
Dairy products		
Liquid	High-Low-fat	Type and amount
Solid	High-Low-fat	Type and frequency
	High-Low-salt	
Fats and oils	High-Low-fat	Type used in cooking
	High-Low-salt	Type used in baking
	High-Low in saturated fat	Type (and amount) used as spread
Meat	High-Low-fat	Frequency
	High-Low-salt	
Poultry		Frequency
Fish	High-Low-salt	Frequency
Eggs		Amount
Cereals	High-Low-fibre	Type and amount (bread)
	High-Low-salt	Frequency (others)
Fruit and berries		Frequency
Vegetables	High-Low-calcium	Frequency
Pulses and nuts		Frequency
Cakes and pastries	High-fat + high-sugar	Frequency
	High-fat + low-sugar	
Sugars and sweets	High-sugar	Frequency
	Artificial sweeteners	
Salty snacks and table salt		Frequency
Beverages	High-sugar	Frequency
	Artificially sweetened	
	High-alcohol	Type and amount
Coffee and tea		Amount

The recommended categories are given in the questionnaire below. The table shows the flow of thinking in designing the local questionnaire. It is recommended that the questionnaire also cover the use of vitamin and

mineral supplements, and changes in diet for health reasons during the past year.

Food consumption records or 24-hour recalls

Food consumption records or 24-hour recall is the same method that is recommended in the optional dietary survey in MONICA, and the minimum sample size should be the same: 200 men in each age decade, or a total of 400 men aged 45–64 years. The manual of operations for MONICA has been prepared within the nutrition programme of the WHO Regional Office for Europe (EURO-NUT) and is available in their report series.

The objective of the MONICA/EURO-NUT dietary surveillance programme is to assess the extent to which trends in morbidity and mortality from coronary heart disease are related to nutrient intake measured at the same time in defined communities in different countries. The food consumption studies are to estimate food and nutrient intake on an aggregate level through each of the three MONICA surveys. The changes in nutrient intake will be calculated from this. Nutrient intake will be described by:

1. total energy intake
2. total fat intake
3. intake of saturated fat (or fatty acids)
4. intake of monounsaturated fat (or fatty acids)
5. intake of linoleic acid
6. total carbohydrate intake
7. intake of mono-, di-, and oligosaccharides
8. intake of polysaccharides (including or excluding indigestible polysaccharides)
9. total protein intake
10. intake of animal protein
11. intake of vegetable protein
12. cholesterol intake.

The intake of each nutrient will be expressed as grams per day and as a percentage of total energy for the energy intake (MJ/day and MJ/day/kg body weight). Cholesterol intake will be expressed in mg/day and mg/4200 kJ.

Even if a food composition table does not contain information on one or more of the nutrients mentioned above, participation in this food consumption study should continue. Information on total energy intake, total fat intake and intake of saturated fat, however, should be considered as a basic minimum. If a three-day food record is not feasible, the 24-hour recall method can be used.

Whenever possible, three-day food consumption records should be collected from both men and women in each of the surveys. If possible, people younger than 45 should also be studied. If record-keeping in the population is not feasible, the 24-hour recall method can be used.

Food formulation and production practice

Food formulation and production practices change continuously, as shown by changes in food legislation and in animal breeding (for example, to produce leaner pork), new foods with reduced salt or sugar content, new types of fat spread mixtures, the increased availability of artificially sweetened foods and non-alcoholic beverages, fluoridation of salt (as in France) and the addition of selenium to fertilizers (as in Finland). These changes are mostly the industry's and authorities' response to the nutrition message. Monitoring them helps to interpret the changes in diet that will be measured in other ways. This type of information has to be collected from many different sources (such as the dairy and meat marketing boards) that vary from one country to another. It is recommended that attention should be paid to this topic in each CINDI area or country, and ways of documenting the changes should be planned at the beginning of the CINDI programme.

Sample Diet Questionnaire

1. What type of fat do you usually use in your home for cooking or frying?

   Oil
   Soft margarine — *To be based*
   Regular margarine — *on locally*
   Butter as well as oil/margarine — *used fats*
   Butter
   Food is not made at my home

2. What type of fat is usually used in your home for baking?

   Oil
   Soft margarine
   Regular margarine — *To be based*
   Butter as well as oil/margarine — *on locally*
   Butter — *used fats*
   Baking is not done at my home

3. What type of fat do you usually use on bread?

   Soft margarine
   Regular margarine — *Depending on*
   Butter as well as oil/margarine — *local customs*
   Butter — *on bread use*
   No butter or margarine

4. How many cups of coffee or tea do you usually have a day?
   __ cups of coffee
   __ cups of tea

5. How many lumps of sugar or spoonfuls of fine sugar do you use in one cup of coffee or tea? __ number

6. Do you use milk or cream in your coffee or tea?

   No milk or cream
   Milk
   Cream
   Don't drink coffee or tea

7. How many glasses (one glass equivalent to 0.2 litres) do you usually have a day?

   Milk ___ *To be extended according*
   Sour milk ___ *to local milk-based drinks*

8. If you drink milk do you usually use:

   whole milk (ordinary cow's milk, +100 about 4.3% or more fat) *To be extended*
   regular milk (about 3.9% fat) *according to*
   low-fat milk (about 1.9% fat) *local milk-based*
   skimmed milk (about 0.5% fat) *drinks*
   I don't drink milk

9. How many slices of bread do you usually eat daily? *(To be adjusted according to bread customs)* ___ slices/day

10. How many eggs (cooked or fried) do you usually eat per week? ___ eggs/week

11. Do you add salt to your meals at the table?

    Never
    When the food is not salty enough
    Almost always before tasting

12. What kind of salt is usually used in your home?

    Iodized salt
    Sea salt
    Mineral salt
    Other salt

13. What type of butter or margarine do you use?

Salt-free
Normally salted
Heavily salted

14. Have you changed your diet for health reasons during the past year?

	No	Yes
Decreased the amount of fat		
Changed the type of fat		
Increased the use of vegetables		
Decreased the amount of sugar		
Decreased the amount of salt		
Increased the amount of bread		

15. How often do you eat the following foods? (Make only one response for each food.)

Food	Once a day or more often	Nearly every day	A few times a week	Once a week	Once or a few times a month	Rarely or never
Beef						
Pork						
Sausages						
Chicken						
Salted fish						
Smoked fish						
Fresh or frozen fish						
Salted mushrooms						
Cheese (specify)						
Potatoes						
Vegetables (specify)						
Fresh fruit						
Fresh or frozen berries						
Porridges or gruels						
Coffee bread						
Cakes						
Sweets						
Soft drinks:						
sweetened with sugar						
artificially sweetened						

Potato chips, etc.

Annex 9

Disability Assessment

Disability Assessment Questionnaire

1. Are you retired because of a disability?

   No
   Yes, partial reimbursement
   Yes, for a definite period
   Yes, indefinitely

2. How many days during the last year (12 months) were you on sick leave from your work or did not do your daily work because of illness? (*If you do not remember exactly, give an estimate.*) ___ days

3. What do you think your present state of health is? Is it:

   Very good
   Reasonably good
   Medium
   Not very good
   Very bad

4. Can you do the following without help?

	Yes	No
Wash yourself in most instances	1	2
Get dressed	1	2
Move upstairs without stopping	1	2
Walk half a kilometre without a rest	1	2
Run a short distance (about 100 metres)	1	2

Run a long distance (over half a kilometre)	1	2

Annex 10

Process Evaluation Survey

Essential survey questions for process evaluation are found in the following questionnaire.

Process Evaluation Survey Questionnaire

1. During the last 12 months did you participate in any lecture, meeting or other health-related activity dealing with smoking, diet, physical exercise, etc.? Yes / No

2. During the last 12 months how often did you read, watch or listen to messages about health issues:

	Weekly	Monthly	Rarely or never
in brochures/leaflets			
on television			
on the radio			
in newspapers			
in magazines			
during lectures			

3. Did any of the following influence you during the last 12 months:

	Family members	Friends	Work-mates	Health workers	Other people	None
to stop smoking *(answer only if you have smoked during the last 12 months)*						
to lose weight						
to eat less fat						
to use less salt						

to drink less alcohol
(answer only if you have consumed alcohol during the last 12 months)

4. During the last 12 months, have you had:

	Yes	No	Don't know
a general health check-up			
your blood pressure measured			
your cholesterol level measured			
your blood sugar level measured			

5. Have you ever been told by health personnel that you have:

	Yes	No
elevated blood pressure		
elevated cholesterol		
elevated blood sugar		
excess body weight**		

6. During the last 12 months, has a physician advised you to:

	Yes	No	Not applicable*
stop smoking *(answer only if you have smoked during the last 12 months)*			
lose weight			
eat less fat			
use less salt			
increase physical activity			
drink less alcohol* *(answer only if you have consumed alcohol during the last 12 months[b])*			

7. During the last 12 months have you seriously tried to:

	Yes	No	Not applicable*
stop smoking *(answer only if you have*			

*smoked *during the last 12 months[b])*
lose weight
use less salt
increase physical activity 1 2 3
drink less alcohol *(answer only if you have consumed alcohol** *during the last 12 months)*

+11

8. In the last 12 months***, have you been able to:

	Yes	No	Not applicable
stop smoking *(answer only if you have smoked during the last 12 months)*			
lose weight			
eat less fat			
use less salt			
increase physical activity			
drink less alcohol* *(answer only if you have consumed alcohol during the last 12 months)*			

9. What is your sex? Male Female

10. What is your age? ___ years

11. How many years of education have you had? ___ years

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* Alternatively use the "not applicable" category or the explanation formulated for smoking and alcohol use.

** Recommended question.

*** Recommended set of questions.

Annex 11

Annual Report Form

Country: ..... Years 19...../ 19.....

1. Programme objectives and documentation
2. Programme administration and management
3. Monitoring, surveys and data collection

Country: ..... Years 19...../ 19.....

4. Intervention, national level

Health-related services

General educational activities

Community organization

Regulatory, structural activities

Country: ..... Years 19...../ 19.....

5. Intervention, demonstration area

Health-related services

General educational activities

Community organization

Regulatory, structural activities

Country: ..... Years 19...../ 19.....

6. Resources and financing
7. Reports and publications
8. Other topics

Annex 12

Check-list for CINDI Site Visit

The following comprise a list of topics for evaluation during a CINDI site visit:

1. local CINDI protocol:
   - the availability of the protocol;
   - correspondence to the WHO CINDI protocol;
   - availability on various aggregation levels (such as area, age, rural, urban, etc.) of:
     – demographic data
     – mortality data
     – survey data (essential, recommended and optional)
     – other data;
2. local CINDI design:
   - countrywide/demonstration area implementation
   - evaluation and standardization procedures
   - managerial structure;
3. health intervention modules:
   - availability
   - educational materials (for health personnel and the public);
4. local CINDI manual of operations;

- availability
- correspondence to WHO CINDI protocol;

5. local CINDI information support:
   - computing facilities
   - data testing procedures
   - access to statistics;
6. local activities:
   - availability of a log of activities
   - intervention activities
   - evaluation activities;
7. links between CINDI and:
   - other health staff and health services
   - sectors other than health;
8. local CINDI team;
9. budget estimate.

Annex 13

Data Transfer Format[8]

The Data Management Centre has the following possibilities for receiving and/or processing data:

- file transfer via electric networks (EARN, WIN, ISDN);
- data storage media (floppy discs, 1,44 MB, 3,5").

Two types of data files are requested:

- organized datasets (SAS, dBase, MS-ACCESS);
- raw data (ASCII-code, text file) plus description of storage formats.

The data should be reported in personal records. Such records must include:

- an arbitrary one-to-one personal identification number;
- the date of examination;
- date of birth;
- sex.

[8] The Data Management Centre does not accept any recording formats that depend on operating systems or utility programmes (such as special separators like EOI (end of information), internal scope format (NOS Systems), etc.).

If more than one record is needed for one person, each record must include the personal identification number at the same physical place. Alphanumeric characters rather than numeric characters should be coded to identify the missing values, incomplete data, etc.