

**The Protocol for the WHO Study on
the Effectiveness of Community-Based Programmes
for NCD Prevention and Control (COMPASS)**

Noncommunicable Disease Prevention and Health Promotion

Noncommunicable Diseases and Mental Health



World Health Organization

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The protocol for the WHO Study on the Effectiveness of Community-Based Programmes for NCD Prevention and Control (COMPASS) builds on the experience accumulated within programmes over more than three decades. It provides a framework and practical advice to help directors, principal investigators, health agencies, community programme workers and health professionals to develop a study on the effectiveness of community-based programmes for integrated NCD prevention and control adapted to their particular mix of interventions and programme conditions.

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FOREWORD

The World Health Organization is for world health. Several recent World Health Reports have shown how world health is undergoing rapid change. The epidemiological transition in the global disease burden means a rapid transition from infectious diseases to chronic noncommunicable diseases (NCD) as major determinants for public health. Already some 60% of all deaths in the world are due to NCDs. A majority of them occur in the developing world where the health service resources to treat the growing burdens of patients are extremely limited.

As a result of extensive medical research, we can today say, with confidence, that the major NCDs are to a great extent preventable diseases. The World Health Assembly in 2000 (WHA53.17), in a global response to this challenge, adopted the WHO Global Strategy on NCD Prevention and Control. The Strategy acknowledges that fighting NCDs is a priority for WHO and that prevention is the area where the greatest public health gains can be achieved. Population-based prevention is the cost-effective, affordable and sustainable way to improve public health and it is available to all countries.

The WHO Strategy lays emphasis on integrated prevention of NCDs. Firstly, this concept means that, instead of vertical, disease-specific prevention programmes, we target the few risk factors that are common to many major NCDs. The Strategy highlights effective action to reduce tobacco use, unhealthy diets and physical inactivity. Secondly, the integrated approach means integrating the prevention efforts within the structures of the community and society – instead of relying on external intervention.

Following the adoption of the Strategy, WHO has upgraded its work on NCD prevention and control. WHO Headquarters and Regional Offices have assisted Member States to upgrade their work so as to build up national policies and strategies for effective NCD prevention. In line with the strategy the Regions have established regional networks for integrated NCD prevention. WHO Headquarters annually holds a Global Forum for NCD Prevention and Control to bring together the regional networks,

Headquarters and many global partners, to share experiences and to discuss useful common actions.

A major recommendation in the WHO strategy is to advise countries to establish community-based demonstration projects as instruments for their overall strategy in national NCD prevention. This recommendation has several backgrounds. First, risk-related behaviours are deeply rooted in the community – in its social, cultural, physical etc. environments. This successful intervention seeks to address the community as a whole as the target of the interventions. The aim is to work together with the community to change the community, so that healthier behaviours become easier and more natural.

Second, the community-based demonstration projects have the role of pilots, to demonstrate the feasibility and the effects of comprehensive NCD prevention with a view to broader national action. Such projects are powerful vehicles to attract popular attention, to inspire decision-makers, to be sources for training and advocacy, and so forth.

Community-based demonstration projects can range from restricted interventions in small communities to comprehensive community interventions in large administrative areas. Every community-based project should include evaluation, to derive lessons from the experience. This evaluation depends on the role and background of the project and on the availability of resources.

In spite of the compelling arguments and some good examples from the developed world, there is a strong need to obtain more solid evidence on the effectiveness of the projects. Thus WHO Headquarters has worked with experts from several major community-based NCD prevention projects to develop a core Protocol for such projects – especially for application in developing countries.

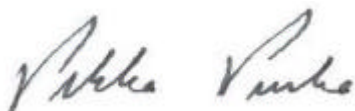
It should be emphasized that this Protocol is meant for major projects that aim at a reduction in the population levels of the main NCD risk factors and that have the potential and role of showing evidence of effectiveness. This Protocol should help such projects to have sound study designs and standardized measurements of risk factor outcomes. It should furthermore

help such projects to work together as an international collaboration, coordinated by WHO Headquarters.

It should also be emphasized that this Protocol is viewed as a core. It is expected that local projects will adopt this to their local conditions and will add measures relevant to their situation.

On behalf of WHO, I would like to thank everybody who has contributed to the development of this Protocol, which was presented at the 3^d Global Forum on NCD Prevention and Control in Rio de Janeiro, 9-12 November 2003. I hope that this Protocol will prove of value to all those working in the field of population-based NCD prevention, whether in countries or globally.

Geneva, 25 November 2003

A handwritten signature in black ink, appearing to read 'Pekka Puska', is centered on the page.

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Acronyms and Abbreviations

BASK	Behaviour, Attitude, Skill, Knowledge
BMI	Body mass index
BP	Blood Pressure
CHD	Coronary Heart Disease
COPD	Chronic obstructive pulmonary disease
CVD	Cardiovascular disease
EHRM	European Health Risk Monitoring Project
FBS	Fasting blood sugar
FCTC	Framework Convention on Tobacco Control
GPAQ	Global Physical Activity Questionnaires
HDL	High density lipoproteins
HBP	High blood pressure
IGT	Impaired glucose tolerance
IHD	Ischaemic heart disease
LDL	Low density lipoproteins
MOH	Ministry of Health
NCD	Noncommunicable disease
NGO	Nongovernmental organization
NSP	Non-starch polysaccharides
PHC	Primary Health Care
SFA	Saturated fat acid
STEPS	WHO STEPwise approach to Surveillance
TC	Total Cholesterol
T2DM	Type 2 diabetes
VLDL	Very low density lipoproteins
WHA	World Health Assembly
WHO	World Health Organization

1. Background

The rapid rise of non-communicable diseases (NCD) threatens economic and social development as well as the lives and health of millions of people. In 2001, NCD contributed to almost 60% of all deaths in the world; 79% of these occurred in developing countries, and they constituted 43% of the global burden of disease⁽¹⁾. New lifestyles are leading to changes in dietary patterns, increasing numbers of smokers and less physical activity - the main risk factors for NCD. These changes, in turn, result in increasing cases of cardiovascular diseases (CVD), cancer, diabetes and chronic obstructive pulmonary diseases (COPD).

This development poses new challenges to public health. The significance of NCDs is reflected in the greater numbers of deaths among people needing hospitalization from these causes. The increase in NCDs rates, together with the ageing of populations, will contribute to an explosive growth in the need for medical services to treat chronic noncommunicable diseases in many developing countries unless effective actions are taken to prevent NCDs. At the same time, the quality of life for both patients and communities will worsen. The pressure for access to medical care combined with the increased cost of care, which requires high technology and expensive treatment, increases inequity. The poor, a vast majority of people living in developing countries, will suffer. They will have less access to medical facilities, whose interventions are likely to be insufficient. The answer to this situation must necessarily lie in the prevention of NCDs and in general health promotion, otherwise the increased cost of medical care "for all" will bankrupt the fragile developing economies. Population-based prevention is the most cost-effective response to this challenge.

Many NCDs can be prevented through influencing risk-related lifestyles. Since lifestyles are deeply rooted in the community, this calls for a systematic community approach which applies carefully designed interventions to tackle lifestyle-related risk factors, and involves activities integrated in the community. All the evidence on prevention of major NCDs justifies the implementation of preventive measures, particularly those aimed at modifying lifestyles and risk factors at the community level and working with the determinants which are the root of the

problem. Meanwhile, research should produce further information and know-how to improve the effectiveness of the strategies proposed.

1.1 NCDs and risk factors

Evidence on the linkage between lifestyle-related risk factors and atherosclerosis started to accumulate in the late 1950s from such prospective cohort studies as the Framingham Study and the Seven Countries Study (2, 3). From the work of Ancel Keys and others, it became apparent that a diet rich in saturated fat results in high cholesterol levels, the major risk factor for coronary heart disease (CHD)(4). Tobacco use and elevated blood pressure are the other well-documented risk factors for CHD and other CVDs such as cerebrovascular diseases (5). The causes of hypertension, including obesity and high salt intake, are equally related to lifestyle (6). The causative association between tobacco use and cancers, especially lung cancer, also derive from the studies made since the 1950s (7, 8, 9).

The common nature of the main risk factors provides the foundation for the integrated prevention of NCDs; the same risk factors can result in various NCDs, such as CVDs, cancer, diabetes and COPD. And the same risk factors at mid-life - elevated cholesterol and high blood pressure levels - also relate to healthy ageing and predict for cognitive impairment and dementia in late life (10).

The risk factors and disease patterns are undergoing continuous change. NCDs and their risk factors are increasing in the developing countries while the burden is levelling off in many developed ones. Globally, lifestyle-related risk factors are common everywhere. Hypertension is equally very common in developing countries, and high blood cholesterol levels already exist there as well (11). Tobacco use is already more common in developing countries and countries in transition than in developed countries (12).

A considerable body of evidence suggests that programmes for NCD risk factor prevention offer feasible and cost-effective ways to tackle the problem. Educating and helping people on lifestyle changes in an integrated manner, namely advising them to eat a healthy diet, to keep physically active and to avoid smoking, is the main emphasis of any community-based initiative for primary prevention of these diseases. In

most developing countries, however, implementation of these activities is scanty due to the lack of awareness of the burden as well as the lack of knowledge about the possibility of influencing the problem.

1.2 Experiences and lessons

The experiences of the developed countries in recent decades have shown how carefully planned and fully implemented community-based programmes for NCD prevention and control are an important component of national strategies to reduce the NCD problem in populations. As long ago as the early 1970s, WHO had helped to start such community-based programmes in some developed countries. These were aimed at promoting risk-reducing lifestyle changes in different populations. Compared with the limited impact on the population that resulted from providing risk-reduction interventions only to people already at clinical high risk within health service settings, the results of community-based NCD prevention projects clearly demonstrated that quite modest risk factor and lifestyle changes in a population would have a huge public health impact (13, 14). Since then, many more community-based programmes have been started in developed countries and are at various stages of development.

The principles and methods of evaluation related to community-based programmes have been developed and discussed in the course of many projects in the developed world (15, 16,17). These experiences have shown how the community programmes form a bridge that can narrow the gaps in scientific knowledge about what needs to be done and about people's readiness to change their undesirable lifestyles. The unhealthy lifestyles related to major NCD epidemics may especially arise during periods of economic transition; nevertheless, curbing the NCD epidemic will still be possible through intensive action to reduce the lifestyle-related NCD risk factors.

Despite the achievements of many successful NCD prevention programmes, critical questions have been raised concerning the evaluation of the intervention effects. Different study designs have been used in the studies, with many of them assessing the effects only by using a pre-test to post-test design. In some studies, intervention and reference communities have been selected without carefully matching, so that a confounding bias has still existed. Interactions between national

development and some community-based programmes have further confused evaluation of the intervention results. Other issues relating to evaluation include how to select the target population and the time framework, target risk factors, the relationship between the dose of intervention and its effects, assessment of the input of programmes, etc. (18,19)

Against this background, the meeting of the WHO Global Forum on NCD Prevention and Control in 2001 stated the following: "While community-based programmes for NCD prevention and control are increasing in many regions – especially as part of the regional networks to tackle the NCD problem - further efforts are needed to promote the effectiveness and good evaluation of such programmes (20, 21)". In particular, there is a need to select carefully designed projects from the countries, particularly from the developing world, as core projects for WHO study in order to gather solid data and evidence of intervention results from community-based programmes in the developing countries (22). This should guide the implementation of the Global Strategy and accelerate development of the projects and, subsequently, of national strategies in those countries. In order to support such development, it was judged essential to initiate a WHO study on the effectiveness of community-based programmes for NCD prevention and control.

1.3 The purpose of the study

The aim of the study is to gather good evidence about the effectiveness of major community-based demonstration programmes which seek to prevent NCDs by reducing risk factor levels in the population, through programmes that are based on sound theories and on proper implementation in the selected communities compared to reference communities. Four projects have been selected from various developing countries as core for the study, additional project will be included in 2004. The final results of the study will guide the work of the Global Forum, the regional networks and national NCD programmes and demonstration projects, and will add to our store of evidence on the effectiveness of community-based prevention and health promotion.

2. Study design

2.1 Goal and objectives

2.1.1 Goal

The goal of this study is to obtain evidence about the effectiveness of integrated community-based intervention programmes for NCD prevention.

2.1.2 Objectives

- 1) To assess the intervention effects on the means and/or prevalence of the target risk factors in the population.
- 2) To assess the intervention effects on prevalence of hypertension, hypercholesterolaemia, obesity and diabetes.
- 3) To assess the intervention effects on the control of hypertension, hypercholesterolaemia, obesity and diabetes.
- 4) To assess the intervention effects on control of other related risk factors among people with hypertension, hypercholesterolaemia and diabetes.

2.2 Standardizing the study design

Classical experimental trials based on random allocation of individuals to experimental and control groups have limitations for population-based NCD prevention. A community-based strategy cannot use the model of traditional experiments. This strategy aims at achieving overall change within the whole community rather than concentrating on individual persons, and tests the effects of a comprehensive package of interventions aimed at a whole range of etiological factors within a natural community setting.

To evaluate the effects of community-based programmes, the quasi-experimental study design experiment is applied instead of a true experiment. The word "quasi" means *as if* or *almost*, so a quasi-experiment means almost a true experiment. A reference area similar to the intervention area is needed to distinguish the intervention effects from the "natural development" in the population. The design includes standardized risk factor surveys of independent random samples among

the populations in both areas at the start and at the end (or at certain intervals) of the programmes (23).

2.2.1 Selection of the intervention and reference area

(1) The intervention area

The intervention areas are often selected on historical, political or other grounds. A compromise should be made between the intensive intervention activities, local policy, legislation development and related sector cooperation.

The smaller the intervention area, the more intensive can be the intervention. But problems arise, such as poor applicability for national intervention or for policy interventions (legislation, food industry). The larger the intervention area, the better will be the applicability of interventions, together with better policy decisions, greater food industry collaboration, and better access to newspapers and local radio. Furthermore, to show significant changes in NCDs, we need large populations. But the problems that arise include the difficulty of maintaining intensive interventions, and of ensuring that the main direct end point is the effect on risk factors (not on NCD). Thus the final decision is a compromise that reflects the local situation. (The populations involved are often 50,000 – 500,000, but could be larger). In summary, the intervention area should be defined by national or local health authorities to meet the needs of the study, with an adequate size of population. Commitments to implement the long-term intervention plan should also be emphasized.

(2) The reference area

In order to separate the effects of intervention from general trends of change, the risk factor changes in the intervention area should be compared with those in a reference community. In addition to the intervention area, therefore, another area with comparable size and structure of population, geographic picture, level of socio-economic development, cultural features and epidemiological pattern should be selected as the reference area. Contamination between areas should be kept at a minimum. Sometimes more than one intervention or reference area may be used.

2.2.2 Target population

The target of the intervention is ideally the whole community but effect evaluation is restricted to the middle-aged population: 25-64 years. If feasible, younger (15-24) and older (over 64) age groups can be included.

2.2.3 Evaluation design

In general, assessments of the effectiveness of noncommunicable disease prevention programmes seek to measure changes in risk factor prevention and in rates of disease or mortality. In this study, the emphasis is on the changes of risk factors (24). Two particular components of the evaluation need to be addressed: **effect evaluation** and **process evaluation**(figure 1).

Figure 1: Study design for effect and process evaluation

Evaluation	Area	Implementation and evaluation (years)					5 (final survey)
		0 (Baseline Survey)	1	2	3	4	
Effect	Intervention	Yes	---	---	---	---	Yes
	Reference	Yes	---	---	---	---	Yes
Process	Intervention	Yes ⁽²⁾	Ongoing ⁽³⁾			→	Yes ⁽²⁾
	Reference	Yes ⁽²⁾	---	---	---	---	Yes ⁽²⁾

(1) Projects may optionally have additional interim surveys, in the intervention area only or in both areas.

(2) Baseline and final surveys should be used, in addition to effect evaluation, for assessment of changes in process variables.

(3) Ongoing (e.g. annual) monitoring examines both process evaluation and intervention, by providing rapid feedback on changes in health behaviours and preventive practices.

2.3 General intervention strategies

The key principle is comprehensive, integrated intervention targeting the community and aiming at a general reduction in the risk factor levels in the intervention community. The intervention should combine the role of health services with broad health promotion measures. The activities should relate to different parts of the health sector (health promotion,

disease prevention and health care/treatment) and to other sectors. Some key aspects of the strategies include:

- Focus on common risk factors;
- Prevention is the key to tackling the NCD and risk factors;
- Combining population and high-risk approaches in a cost-effective way at community level;
- Cooperation and coordination;
- Comprehensive integrated NCD prevention.

2.3.1 Why focus on main risk factors, common to several NCDs

The main aim of the present studies is to evaluate the intervention effects on smoking, diet, physical activity, cholesterol, overweight and obesity, diabetes and hypertension. The ultimate success of these projects will be indicated by a significant reduction in the level of common risk factors (both behavioural and biological) which will lead to a decline in morbidity from these related NCDs (25).

Any study on the effectiveness of community-based prevention programmes must have a clearly defined scope, in order to determine whether a comprehensive, community-based intervention can have the desired effect on the main risk factors at the population level. The focus will therefore be on the areas of tobacco control, healthy dietary habits and physical activity.

2.3.2 Prevention is the key

NCD prevention should concern all stages of the natural history of chronic diseases. This means activities at all levels of prevention: primary, secondary and tertiary prevention. However, primary prevention is the key because the population impact of secondary and tertiary prevention is comparatively limited and risk factor changes, even in the patient groups, are highly dependent on general lifestyles in the community. Primary prevention of NCDs usually has a lower profile in the developing countries than the primary and secondary prevention of communicable diseases. It is therefore all the more important to find best practices to promote the primary prevention of NCDs in developing country settings. This study adopts the experiences gained from studies on

prevention of NCDs in the developed countries conducted since the 1970s (26).

2.3.3 Combined population and high-risk population approaches

Because the bulk of patients come from the people in general, a large segment of the population with only moderate risk, population strategy is the first choice for an effective intervention. Population strategy focuses on the entire population; it influences the whole spread of risk factors in the population and emphasizes general lifestyle changes. Because the absolute numbers of new cases come from the people with moderate risk, population strategy reduces the incidence of NCDs more than a high-risk strategy alone (27). However, although the emphasis is on population strategy, the high-risk strategy is important for persons with high risk. Furthermore, population strategy and high-risk strategy are not mutually exclusive. Thus this study will use both population and high-risk strategies when implementing the intervention in the community.

2.3.4 Cooperation and coordination

In primary prevention of NCDs, the role of the health sector is important. This particularly concerns patients with hypertension and/or diabetes, or with high risk of CVD. But other sectors too are important for comprehensive interventions, for example, the mass media in health education of the population, the food industry and agriculture in promoting healthy dietary habits, and pricing policy in tobacco use. Interventions should combine the medical and epidemiological framework with social behavioural theories.

This study simultaneously applies medical and epidemiological knowledge (to identify the problems and the risk factor targets) and social and behavioural knowledge (to design the actual programme content and activities). Consequently, the interventions aim to spread knowledge, to advocate for change, to teach practical skills and to provide the necessary social and environmental support for the performance and maintenance of these health skills in the population. Acquiring and maintaining new behaviours ultimately result in general and sustained changes within the community, with a more favourable risk factor profile, reduced disease rates and improved health of the population. This concept requires

interdisciplinary cooperation and coordination, not only throughout the planning and intervention phases, but also during the evaluative research.

2.3.5 Comprehensive integrated NCD prevention

Integration is a key principal factor in the study approach to NCD prevention. Integration means, firstly, that programmes aim at interventions that bring joint action to bear on common risk factors. Secondly, it calls for a comprehensive approach combining different strategies for implementation, including policy development, capacity building, partnership and information support at all levels. Thirdly, integration calls for intersectoral action to implement health policies; this additional aspect of integration is needed to address the major determinants of health that fall outside the remit of the health system. Fourthly, integration refers to efforts to combine population and high-risk approaches by linking the preventive actions of various components of the health system, including health promotion, public health services, primary care and hospital care. In short, integration means building on existing health infrastructures and resources, and covering the full continuum of health promotion, disease prevention and clinical care.

The strategies will integrate the relevant activities of the health services, public education, community organization and regulation. The priority strategies for intervention are public education and the mass media, marketing, guidelines for practice, and professional education and involvement. To obtain favourable changes in the distribution of risk factors in the population, the comprehensive population strategy will be adjusted to the local situation.

Although the study intervention's principles will be planned from the outset, implementation in the target community must be flexible so as to take advantage of the naturally occurring possibilities and to reflect the observed developments.

2.4 Intervention targets

The accumulated scientific knowledge demonstrates that even quite small changes can be significant, for instance, little changes in blood cholesterol or in the frequency of smoking can play an important role in changing the prevalence of related diseases. Primary prevention will emphasize those

factors that are likely to lead to a reduction in risk for several NCDs. Priorities are based on the prevalence and importance of each given factor, the current possibilities of influencing it and the feasibility of monitoring changes in the community. The aim of intervention should be to detect a widening gap between improvements in lifestyles in the intervention area and any upward trends in the reference area due to other factors.

2.4.1 Intervention targets at population level

The intervention target is to have a measurable effect at the population level on the risk factors in the intervention community, as compared with the reference community. In this study, the target is a measurable and significant reduction in the mean or prevalence of the proposed core risk factors.

(1) Behavioural, biological risk factors

For behavioural and biological risk factors, the target is a reduction in their mean or prevalence at the population level:

◆ **Behavioural risk factors:**

- Tobacco use
- Unhealthy diet
- Physical inactivity
- Alcohol (optional)
- Coping with stress (optional)

◆ **Biological risk factors:**

- Serum total cholesterol
- Serum LDL cholesterol (optional)
- Blood pressure
- Blood glucose (optional)
- Overweight/obesity

(2) Control of hypertension, hypercholesterolaemia and diabetes

For hypertension, hypercholesterolaemia and diabetes, intervention targets will be:

- Improve detection
- Effective management, including reduction of risk factors
- Systematic follow-up of hypertension and diabetes patients.

Other optional targets may be selected in the participating projects. These targets will have to be specified in operational terms, with achievable goals set in the programmes, particularly with a view to later evaluation.

2.4.2 Reference values

The following chapters show the internationally recognized reference values for behavioural and biological risk factors.

(1) Behavioural risk factors

Table 1 gives an example of intervention targets and behavioural risk factors in accordance with WHO/FAO recommendations (28).

Table 1 Specific Intervention targets – Behavioural risk factors

Beh-RFs	Recommendations	Reference
Smoking	No Tobacco use	
Physical Activity	Accumulate at least 30 minutes of moderate-intensity physical activity every day (leisure time, transportation, work, home)	WHO/FAO/916
Diet	<p>Total fat: daily intake 15-30% of total energy.</p> <p>– Saturate fat: intake of less than 10% of daily energy and less than 7% for high – risk groups</p> <p>Total carbohydrate: 55-75% of total energy.</p> <p>– Free sugars: < 10% of total energy.</p> <p>Protein: 10-15% of total energy.</p> <p>Cholesterol: <300 mg per day</p> <p>Fruits and vegetables: in adequate quantity (\geq 400g per day)</p> <p>Sodium Chloride(Sodium): <5g per day (<2g per day).</p> <p>Potassium: intake should be at a level which will keep the sodium to potassium ratio close to 1.0, i.e. a daily potassium intake level of 70-80 mmol per day.</p> <p>Total dietary fibre: maintain high levels and increase intake</p> <p>Non starch polysaccharides (NSP): maintain high levels and increase intake.</p>	WHO/FAO/916

The above mentioned factors are likely to favourably influence certain biological factors, such as blood cholesterol, blood pressure and relative weight, for which target values will also be needed.

(2) Biological risk factors

Table 2 gives an example of intervention targets and biological risk factors for a population in accordance with WHO/FAO and related international organizations recommendations (table 2).

Table 2

Specific Intervention targets – Biological risk factors		
Bio-RFs	Recommendations	Reference
Body Mass Index (BMI)	Maintain a BMI in the range 18.5 – 24.9 (kg/m ²), and avoid a weight gain greater than 5 kg during adult life.	WHO/FAO/916
	Reduction in prevalence of obesity (BMI _≥ 25).	WHO/FAO/916
Blood Lipids	Total Cholesterol: < 5mmol/L (190mg/dl)	(29,30)
	LDL-Cholesterol: < 3mmol/L (115mg/dl)	(29,30)
Optimal Blood Pressure	SBP < 120 mmHg and DBP <80mmHg	(31)

2.4.3 Diagnostic categories

(1) Blood pressure levels

Table 3 suggests a classification of blood pressure levels (31).

Table 3

Optimal, normal, satisfactory, hypertensive blood pressure levels

	SBP (mmHg)		DBP (mmHg)
Optimal	< 120	and	< 80
Normal	< 130	and	< 85
Satisfactory	130 - 139	and	85 - 89
Hypertension	≥140	and/or	≥ 90

(2) Overweight and obesity

Table 4 suggests a classification of overweight/obesity in adults according to BMI (28, 32).

Table 4

Classification of overweight in adults according to BMI	
Classification	BMI (kg/m²)
Underweight	< 18.5
Normal range	18.5 – 24.9
Overweight	≥ 25.0
Pre-obese	25.0 – 29.9
Obese I	30.0 – 34.9
Obese II	35.0 – 39.9
Obese III	≥ 40.0

(3) Diabetes

Table 5 suggests the diagnostic values for the oral glucose tolerance test (33).

Table 5

	Diagnostic values for the oral glucose tolerance test			
	Glucose concentration, mmol/L(mg/dl)			
	Whole blood		Plasma	
	Venous	Capillary	Venous	Capillary
Diabetes mellitus				
fasting value	≥ 6.7 (≥ 120)	≥ 6.7 (≥ 120)	≥ 7.8 (≥ 140)	≥ 7.8 (≥ 140)
2 hours after Glucose load	≥ 10.0 (≥ 180)	≥ 11.1 (≥ 200)	≥ 11.1 (≥ 200)	≥ 12.2 (≥ 220)
Impaired glucose tolerance				
Fasting value	< 6.7 (< 120)	< 6.7 (< 120)	< 7.8 (< 140)	< 7.8 (< 140)
2 hours after Glucose load	6.7 – 10.0 (120-180)	7.8 – 11.1 (140-200)	7.8 – 11.1 (140-200)	8.9 – 12.2 (160-220)

(4) Hypercholesterolaemia

Blood cholesterol: ≥6mmol/L (240mg/dl) (29, 30).

3. Planning

The practical framework of the study in the participating projects has three components: planning, intervention or programme implementation, and evaluation. Although they ideally occur sequentially, these elements are often accomplished simultaneously.

3.1 Situation analysis and community diagnosis

Community diagnosis provides a comprehensive understanding of the situation at the start of the programme (24). It offers a basis for determining appropriate and effective methods for the intervention. It will include existing data from previous studies, statistics including mortality and morbidity, legislation and rules, consultation with experts, and listening to local people and special focus groups. Later on, the baseline survey findings can be used to complement the picture. The main contents of the community diagnosis include:

- To identify social and cultural patterns and health-related behaviour which may impact on health in general and on NCDs in particular.
- To identify risk factors for major NCDs and their determinants and to obtain standardized and reliable data on dietary patterns, prevalence of smoking, lack of exercise or physical inactivity, and local knowledge, attitudes and practice regarding all of these. Some relevant additional information on alcohol consumption and psychosocial factors could be included.
- To identify the existing health infrastructure in the community.
- To identify potential community resources and how they may be developed in all related sectors.
- Organizing a meeting coordinated with the directors or principal investigators of the projects or the coordinating council in order to prepare the project in conformity with the programme's targets.
- Ensuring good infrastructure and services, with diagnosis of the existing plans in the health system or related fields (their weakness or gaps).
- Preparing a list of activities showing alternative ideas and options.
- Using the results obtained from the initial survey and taking into consideration all existing resources (human, economic, etc.) or systems, so that the interventions can then be revised.

3.2 Determining the specific practical objectives

In each study, the objectives will be ultimately revised and refined in the light of the community diagnosis, current medical/epidemiological knowledge and the local prevalence of risk factors. The very specific practical objectives and the realistic intervention measures will emerge from careful analysis of the community and from the strategic determinants of the most immediate objectives.

3.3 Project organization and other preparatory steps

The following steps and elements are an essential part of the study plan. For each, the best (or alternative) solutions which are feasible for each community should be elaborated in detail:

- making initial decisions and commitments
- choosing the community (if not given for historical reasons)
- drawing up initial funding commitments and plans
- involving stakeholders, community leaders and funders
- establishing the project team and the focal point(s)
- establishing the management structure, project team, steering committee and other relevant committees
- ensuring the collaboration of the health infrastructure and medical community
- building up intersectoral collaboration, partnerships and community involvement.

4. Intervention

Interventions should be simple, practical, continuous and capable of being evaluated. It should be possible to implement them within a wide spectrum of the community, making use of all available resources. Interventions could form a part of the regular work of the health professionals. Every effort should be made to avoid duplication or overlapping of activities. The watchword should be "do the right thing and do enough of it!"

4.1 Programme implementation

The goal is to implement the programme systematically according to its aims and principles. Within this framework the actual implementation

needs to be sufficiently flexible to adjust to any unforeseen opportunities that may arise in the community. Community participation means that practical activities are carried out mainly by volunteer citizens, groups and organizations within the community. Identifying and mobilizing the community resources will involve working closely with community agencies, voluntary organizations and opinion leaders. The programme catalyses this work by providing materials, training, the necessary official support, media involvement and follow-up.

These activities should be integrated into the existing service structure and social organization of the area. Community involvement and individual participation are the key. During the intervention, practical skills will be taught, support for social change will be provided and environmental modifications will be arranged as part of the comprehensive community organization aimed at bringing about healthy change.

4.2 Intervention categories

The intervention is categorized as follows:

- (1) Public education through**
 - mass media
 - health education materials
 - campaigns
- (2) Establishment of practice guidelines**
 - Management of diabetes
 - Management of hypertension
 - Management of hypercholesterolaemia
 - Cholesterol
 - Tobacco cessation
- (3) Personnel education and training**
 - health personnel
 - other personnel
 - lay leaders
 - community leaders
- (4) Strengthening and organizing existing services and intervention measures in:**
 - primary health care
 - community leaders
 - teachers

- schools and workplaces
- others

(5) Intersectoral cooperation

- Tobacco policies, smoking free initiatives
- Policy reinforcement
- Food industry, catering
- Environment changes to promote project activities
- Shops

(6) Rapid monitoring and feedback to the community

This relates to process evaluation to keep the community informed of developments and maintain their interest in specific interventions.

5. Evaluation

The functions of evaluation are to assess the extent to which a programme has attained its objectives, and to assess the process of the programmes' development and performance (34). As mentioned in the evaluation design for this study, evaluation includes two components: process evaluation and effect evaluation.

5.1 Process evaluation

Process evaluation is concerned with documenting the intensity of interventions, their outreach and their short-term outcome; in other words, it is a description of project activities and feasibility. Most importantly, it seeks to track the process that leads to those outcomes, by contrast with traditional effect evaluations. The purpose of process evaluation is to monitor how a particular intervention works and to assess the programme implementation, i.e. its feasibility and progress. It will also focus on whether an intervention has produced changes (for example, effects on such factors as knowledge, or prevention measures), and will provide practical feedback to those responsible for an intervention, so that they can improve its design and performance.

Process evaluation enables programme personnel to assess the quality and cost of delivering preventive interventions, and to demonstrate accountability to the funding source. It also yields information on the programme and project designs that are most suitable for demonstration,

dissemination and large-scale deployment. More specifically, process evaluation is needed to:

- Identify factors, links and process indicators that may help to explain success and/or failure in terms of the underlying programme's rationale (such as social behavioural theory);
- Contribute to a better understanding of the organizational or situational context of a given intervention (see CINDI process evaluation)

Although this protocol is intended to provide guidelines for international cooperation, there may be compelling reasons for some projects to deviate from its proposals. Each project centre should develop its own key questions aimed at soliciting information on knowledge, skills, social support and preventive practices in the community concerned.

The programme documentation for process evaluation should include the protocol as well as basic socio-demographic population characteristics, information on programme structure, organization, intervention activities and sub-programmes.

In addition, some of the process information will also be collected (34), such as:

- progress made in programme implementation
- proportion of the target population reached (data obtained through activity log, contact cards) via individual or group counselling (number of participants), health services (screening campaigns etc) or mass media
- legislative action (existence of new laws, regulations aiming at one or several of the programme targets)
- utilization rates (e.g. blood pressure measurement density in the population), to be obtained through the health questionnaire survey.

5.2 Effect evaluation

Effect evaluation requires a comparison of risk factor changes in the intervention and reference communities. Indicators of target high-risk factors (both behavioural and biological) are measured through carefully standardized population surveys of independent population samples in the two communities at the outset and at the end of the study period. These

indicators may also be measured at intervals, depending on the resources available.

5.2.1 Information collection

The following information is needed and should be obtained through the surveys in a standardized way:

- (1) Background**
 - Socio-economic
 - Demographic
- (2) Behavioural risk factors**
 - tobacco use
 - physical inactivity
 - unhealthy diet (questions should be chosen or developed by the projects depending on their specific intervention targets, but core questions should include consumption of fruits, salt, saturate fat, sugar and vegetables)
- (3) Biological risk factors**
 - blood total cholesterol
 - blood pressure
 - fasting blood glucose (2 hours long)
 - body height/weight
- (4) Other health behaviours (optional):**
 - Alcohol
 - Coping with stress
- (5) Awareness and diagnosis**
 - Diabetes
 - Cholesterol
 - Elevated blood pressure
 - Elevated blood cholesterol
- (6) Medication**
 - For hypertension
 - For high cholesterol
 - For diabetes
- (7) Health indicators**
 - Self-rated health (optional: other subjective health assessments).

It should be noted that, for the international study, measurement of diet is very complex and there is no way of developing a standard questionnaire.

Instead a set of simple questions should be formulated. Ideally, assessing changes in diet should take place through a nutrition survey, but this is not feasible in every site. The minimum requirement for a project centre is to assess changes in those *local* dietary habits that are key intervention targets - especially those related to foods containing high amounts of saturated fats.

5.2.2 The method of information collection

For examples of process evaluation and effect evaluation in practice, compare the WHO MONICA project Manual, CINDI process evaluation, CINDI monitor, and EHRM (17, 34, 35, 36).

6. Costs

Each project should keep track of the direct costs of interventions and, separately, the costs of planning, intervention, monitoring and evaluation. It should also try to determine some of the major costs incurred within the community; these may prove to be relatively small. The purpose of the project is not to save money, but to test the effects of intervention. Efforts may be made to arrange cost-sharing activities with other sectors.

Measurement of indirect costs may prove to be almost impossible, e.g. to assess the value of newspaper, television and radio coverage.

A breakdown of costs to be used in the planning, implementation and evaluation of the project might show:

- (1) **Total expenditure** (direct project cost as core information).
- (2) **Resource (direct):**
 - Government
 - Foundation or NGOs
 - Research
 - Community
 - Others
- (3) **Resource (indirect)**
 - Resource from other sectors
 - Sharing activities with other sectors
 - Cost incurred in the community

- Cost of intervention activities

(4) Outputs and outcomes

- Outputs
- Outcomes

Many methods can be used for measuring the cost-effectiveness of the community-based programme for NCD prevention, for instance, comparison with hospital expenditure in the treatment of patients with stroke, thus showing how savings may be made by reducing the incidence rates of stroke through interventions on risk factors.

7. Programme management

The management of each project will depend on the country's circumstances. In general, the management structure and team at national and local level should be identified:

7.1 National committee

In order to ensure national support and guidance for the project, the following should ideally be involved:

- **MOH** (Ministry of Health).
- **National NCD Committee.** Existing committees such as CVD, cancer, diabetes and so forth could be members), and other members could come from other appropriate ministries or organizations.
- **NGOs:** medical association, national heart federation and others.
- **Focal point:** from NCD Units in the MOH or national institutes.
- **Project director/principal investigator** (coordinators/co-principal investigators).
- **National technical institutes.** National institutes and research teams should be involved in the national committee and the activities of the projects.

7.2 Local management structure and team

For project implementation in the field, the organizational structure and teams could consist of:

- **Intervention coordinator and steering committee.**

- **Project council or group** (to ensure broader targeting within the community).
- **Various working groups.**
- **Focal points for different activities** (e.g., mass media, health services, and private sector).
- **Management structure:** The managerial structure should also be concerned with the project’s participation in the international WHO study.

8. International collaboration and resource mobilization

8.1 WHO’s Role

WHO has upgraded the role of NCD in countries as part of the Global Forum, and is seeking to work more closely with regional networks and other international networks. Community-based programmes for NCD prevention and control will play an increasingly important role in NCD prevention activities within the framework of the Global Forum.

Consequently, carefully planned community-based projects will increasingly be needed to provide evidence that these kinds of intervention actually work. They must also be seen to relate to other efforts in NCD prevention and health promotion, particularly in developing countries. Proper evaluation will ensure that the best advantage is taken of the knowledge and experience derived from the core group of projects. This experience should in turn be reflected in many other countries and will enable general guidelines to be drawn up on how to set up the demonstration projects for NCD prevention.

Within this framework, WHO will promote as much international exchange of information as possible, for instance through training courses and regular exchanges of experiences aimed at stimulating further collaboration. A good protocol should be actively exploited in such a way as to improve the chances of raising more financial support without relying too much on extra-budgetary sources. This may involve approaching leading foundations to interest them in investing in the programme.

8.2 International cooperation and coordination

- (1) Cooperation between the study projects.
- (2) Cooperation with the regional networks for NCD prevention and control, and other networks.
- (3) Partnerships with international institutes, NGOs and foundations.

8.3 International project group

The core group consists of directors or investigators from the projects, WHO representatives and experts. It will provide technical support to the projects. Its activities should include:

- (1) Efforts to obtain as much evidence as possible of the effectiveness of the projects.
- (2) Drawing up general guidelines for future demonstration projects.
- (3) Stimulating collaboration.
- (4) Technical assistance in the development of the protocol; planning, monitoring and evaluation; capacity building and training.
- (5) Advocacy for this particular project.
- (6) Information.
- (7) Publication.

WHO will provide secretariat assistance to the group.

9. Study financing

Each country should raise adequate funds for the implementation and management of the demonstration projects. However, some funding from international sources will be sought for international coordination, evaluation and, if possible, support to the participating project.

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Glossary of Terms

The following is a selection of commonly used terms of NCD prevention and health promotion.

1. Advocacy

Advocacy is a combination of individual and social actions designed to gain political commitment, policy support, social acceptance and systems support for a particular health goal or programme. Generally it aims at increasing awareness, support and commitment for a particular health goal.

2. Capacity building

Capacity building is the development of the technical expertise to plan, implement and evaluate interventions aimed at preventing or controlling NCD in a variety of settings.

3. Community

In general, a community is a collective of people identified by common values and mutual concern for the development and well-being of their group or geographical area. In this study, community signifies the concept of the geographic area or special setting.

4. Community-based approach (population approach)

Community-based programmes are intended to monitor and diagnose the health concerns of entire communities and promote healthy practices and behaviours so as to ensure that the population stays healthy. For this study, community-based programmes for NCD prevention and control target population health within the community and through the community, by common risk factors intervention, health service orientation, community mobilization and participation, and other activities within the community.

5. Community mobilization

Community mobilization is a process aimed at enabling communities to understand and control the circumstances affecting their health.

6. Community participation

A process by which people are enabled to become actively and genuinely involved in defining the issues of concern to them, in making decisions about factors that affect their health. It requires going beyond consultation to enable citizens to become an integral part of the decision-making and action process. It relates to community ownership whereby local people feel that it is " their programme".

7. Evaluation

A programme evaluation is an assessment of a programme to determine, in the light of current circumstances, the experiences with the programme, as well as its intended and unintended results.

- (1) **Process evaluation** assesses the way an activity or strategy was run, and the extent to which it was implemented as planned. It also addresses the process through which the results were or were not achieved. Process evaluation relates to the theoretical framework used, and is concerned with intermediate variables.
- (2) **Effect evaluation** measures the short-term effects of the programmes and is concerned with whether the set objectives were achieved. In this study, effect evaluation seeks to compare the changes of risk factors in the intervention and reference communities.

8. Health education

Health education is not only concerned with the communication of information, but also with fostering the motivation, skills and confidence (self-efficacy) necessary to take action to improve health. Health education includes the communication of information concerning the underlying social, economic and environmental conditions impacting on health, as well as individual risk factors and risk behaviours and use of the health system.

9. Health promotion

Health promotion is the combination of educational and environmental support for actions and conditions of living conducive to health. The actions may be those of individuals, groups or communities, of policy-makers, employers, teachers or others whose activities control or influence the determinants of health. The purpose of health promotion is to enable people to gain greater control over the determinants of their own health. Health promotion is also the process of enabling people to increase

their control over and to improve their health. To reach a state of complete physical, mental and social well-being, an individual or group must be able to identify and realize aspirations, satisfy needs, and change or cope with the environment. In health promotion, therefore, health is seen as a resource for everyday life, not the objective of living. Health is a positive concept, emphasizing social and personal resources, as well as physical capabilities. Thus, health promotion is not solely the responsibility of the health sector, and its concerns go beyond healthy lifestyles to well-being, as stated in the Ottawa Charter for Health Promotion.

10. High-risk population

Among entire population, high-risk populations are defined according to exposures or behaviours that put individuals at risk for diseases.

11. Health targets

Targets are generally based on specific and measurable changes in health outcomes, or intermediate health outcomes.

12. Integrated NCD prevention and control

Integrated NCD prevention and control involves addressing risk factors common to several NCDs, and the multiplicity of risk factors with multifaceted strategies through multi-level partnerships. Action to reduce the major NCDs should focus on preventing and controlling the risk factors in an integrated manner. Intervention at all levels of society, from communities to governments, private organizations and nongovernmental groups, is essential for prevention since the risk factors are entrenched in the framework of society and are influenced by many areas of national policy.

13. Intersectoral collaboration

Intersectoral collaboration is a recognized relationship between different sectors of society which has been designed to take action on an issue so as to achieve improvements in health in ways that are more effective, efficient or sustainable than might be achieved by the health sector acting alone.

14. Intersectoral action

In intersectoral action, the health sector and other relevant sectors collaborate to achieve a common goal. For practical purposes, intersectoral and multisectoral action are synonymous.

15. Intervention

In the World Health Report 2002, an intervention means " *any health action – any promotive, preventive, curative or rehabilitative activity where the primary intent is to improve health*".

16. Lifestyle

A lifestyle is an aggregate of behaviours of individuals that affect their health. The potential health hazards referred to as behavioural risk factors are related to such lifestyle decisions. Individual exposure to lifestyle-related determinants of disease is to a large extent voluntary, and can be modified. In addition, lifestyle is taken to mean a general way of living, based on the interplay between living conditions, in the wide sense, and individual patterns of behaviour, as determined by sociocultural factors and personal characteristics. The range of behaviour patterns open to individuals may be either limited or extended by social and environmental factors and, for this reason, lifestyles are usually considered in the context of both collective and individual experiences and conditions of life.

17. Mass media

The mass media are all the impersonal means by which visual and/or auditory messages are directly communicated to the public. Examples of mass media include television, radio and newspapers.

18. Monitoring

Monitoring means regularly observing changes in some condition, either in a population or an individual (such as health status) or in an environment (such as levels of pollution), in order to determine whether an initiative is proceeding according to plan. Monitoring includes keeping track of achievements, staff movements and deployment, supplies, equipment and money spent. The information gained from monitoring is essential for evaluating the initiative.

19. Objectives

Objectives are the building blocks or steps that need to be achieved to reach a goal. Objectives are specific, measurable and concise statements about the immediate intention of a health promotion programme, stating who will make what change, by how much, where and by when.

20. Outcome

An outcome is a change in current or future health status or health-related behaviour that can be attributed to an intervention. In the field of health, the desired result or impact of a policy measure or other health intervention would be a positive change in health status or health behaviour.

21. Outcome assessment

An outcome assessment is used to determine the short-term effects of an intervention on an identified population in effecting changes in the current or future health status of health-related behaviour.

22. Planning

Planning is the process of defining needs, establishing priorities, diagnosing causes of problems, assessing resources and barriers, and allocating resources to achieve objectives.

23. Policy

A policy is an agreement or consensus among relevant partners on the issues to be addressed and on the approaches or strategies needed to deal with the issues.

24. Policy framework

A policy framework is a conceptual structure, based on consensus among major stakeholders, which shows the relationships between the philosophy, intentions and principles that will guide decision-making and actions concerning specific issues.

25. Prevention

Prevention refers to approaches and activities aimed at reducing the likelihood that a disease or disorder will affect an individual, interrupting or slowing the progress of the disorder or reducing disability. Primary

prevention reduces the likelihood that a disease or disorder will develop; secondary prevention interrupts, prevents or minimizes the progress of a disease or disorder at an early stage; and tertiary prevention focuses on halting the progression of damage already done.

- (1) **Primary prevention.** It is defined as the protection of health by personal and community-wide effects, e.g., preserving good nutritional status, physical fitness, and emotional well-being, immunizing against infectious diseases, and making the environment safe. An example is fluoridation of the water supply as an approach to preventing dental caries.
- (2) **Secondary prevention.** This is defined as the measures available to individuals and populations for the early detection and prompt and effective intervention to correct departures from good health. Secondary prevention aims to stop or slow an existing illness by early detection and appropriate treatment. Secondary prevention refers to activities that are aimed at:
 - early detection of disease and prompt treatment to cure disease during its earliest stages, or
 - slowing its progression, preventing complications and limiting disability when cure is not possible.
- (3) **Tertiary prevention.** This consists of the measures available to reduce or eliminate long-term impairments and disabilities, to minimize suffering caused by existing departures from good health, and to promote the patient's adjustment to irremediable conditions. This extends the concept of prevention into the field of rehabilitation. Tertiary prevention aims to reduce the re-occurrence and establishment of chronic illness.

26. Quality of life

Quality of life is defined as an individual's perceptions of his or her position in life in the context of the culture and value system where each person lives, and in relation to each person's goals, expectations, standards and concerns. It is a broad-ranging concept, incorporating in a complex way a person's physical health, psychological state, level of independence, social relationships, personal beliefs and relationship to salient features of the environment.

27. Risk factors

In the World Health Report 2002, risk is defined as "a probability of an adverse outcome, or a factor that raises this probability". Risk factors

refer to characteristics of individuals or the environment that are causally related to risk.

28. Sampling

This is the process of selecting a subset, the study sample, from the target population. The study sample may be a random sample of the total target population, but is more often drawn from a subset, the study population. For example, the target population might be the population of a province, the study population might be the population of the main town, and the study sample might be every tenth household.

29. Target group

Target group refers to the individuals, communities or organizations that will be influenced or will have positive health gains as a result of the health promotion programme.

30. Target population

The target population refers to those sections of a community from which a study is to draw certain conclusions (e.g., prevention of hypertension, mean body mass index). It is unusual to examine the entire target population, and a representative study sample is normally selected.

Annex A.

Study Questionnaires

ID Number:

1. Demography

1.1 **Family Name:** **First Name**

1.2 **Address:** (No/street, Township)
City (District/county)

1.3 **Date of Birth:** / /
DD / MM / YY

1.4 **Sex:** (1). Male (2). Female

1.5 **Marriage:** (1).Single (2). Married (or cohabited)
(3).Divorced (4). Widowed

2. Questionnaires

A. Self-rated health

A1. **How would you assess your present state of health?**

1 = Good

2 = Rather good

3 = Average

4 = Rather poor

5 = Poor

B. Socio-economic status

SES1	<i>How many years in total have you spent in school or in full time study?</i>	_ _ _
SES2	<i>What is your highest level of education?</i> <i>1 = Primary education, or first stage of basic education, or less</i> <i>2 = Lower secondary education, or second stage of basic education</i> <i>3 = (Upper) secondary education</i> <i>4 = Post-secondary non-tertiary education</i> <i>5 = First stage of tertiary education</i> <i>6 = Second stage of tertiary education</i>	_ _
SES3	<i>What is your current employment status?</i> <i>1 = Employed</i> <i>2 = Doing housework at home</i> <i>3 = Student</i> <i>4 = Retired/long-term disabled</i> <i>5 = Unemployed</i>	_ _

C. Smoking

SMK1	<i>Do you now smoke?</i> <i>1 = Yes, daily (Go to question SMK2)</i> <i>2 = Yes, occasionally</i> <i>3 = Not at all</i>	<input type="checkbox"/>
SMK2	<i>On average, how many times do you smoke per day? (number of cigarettes, cigars, pipefuls of tobacco etc.)</i>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
SMK3	<i>Have you during the past year (12 months) been advised by a health professional to stop smoking?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = I have not smoked during the past 12 months</i>	<input type="checkbox"/>
SMK4	<i>Are you exposed to indoor tobacco smoke at home?</i> <i>1 = Yes</i> <i>2 = No</i>	<input type="checkbox"/>
SMK5	<i>About how many hours per day are you exposed to indoor tobacco smoke at your workplace?</i> <i>1 = I do not work outside the home</i> <i>2 = Almost never</i> <i>3 = Less than one hour a day</i> <i>4 = 1-5 hours a day</i> <i>5 = More than 5 hours a day</i>	<input type="checkbox"/>

D. Physical activity

PA1	<i>How tall are you?</i>	_ _ _ _ cm
PA2	<i>How much do you weigh in light clothing</i>	_ _ _ _ kg
	<p>Vigorous physical activity: This refers to activity that requires hard physical effort and makes you breathe much harder than normal and may include heavy lifting, digging, aerobics, or fast bicycling</p>	
PA3	<p><i>During the last 7 days, on how many days did you do vigorous physical activities?</i></p> <p><i>Think only about physical activities that you did for at least 10 minutes at a time.(Please mark 0 if you did not do any vigorous physical activity)</i></p>	On _ days during the last 7 days
PA4	<p><i>How much time in total did you usually spend on one of those 7 days doing vigorous physical activities?</i></p> <p><i>(An average time per day is being sought. If you can't answer because the pattern of time spent varied widely from day to day, divide by 7 the total amount of time you spent over the past 7 days doing vigorous physical activities)</i></p>	_ _ hours _ _ minutes/day
	<p>Moderate physical activity: This refers to activity that requires moderate physical effort that makes you breathe somewhat harder than normal and may include carrying light loads, bicycling at a regular pace, or playing tennis doubles. Do not include walking.</p>	
PA5	<p><i>During the last 7 days, on how many days did you do moderate physical activities?</i></p> <p><i>Think only about physical activities that you did for at least 10 minutes at a time.(Please mark 0 if you did not do any moderate physical activity.)</i></p>	On _ days during the last 7 days

PA10 ***How many minutes a day do you spend walking or riding a bicycle to and from work?***

(Combine time spent both ways)

1 = I do not work at all or I work at home

2 = I go to work by car

3 = less than 15 minutes a day

4 = 15-30 minutes a day

5 = 30-60 minutes a day

6 = more than one hour per day

PA11 ***In your leisure time, how often do you do physical exercise for 30 minute, which makes you at least mildly short of breath or perspire?***

1 = daily;

2 = 4-6 times a week

3 = 2-3 times a week

4 = once a week

5 = 2-3 times a month

6 = a few times a year or less

7 = I cannot exercise because of illness

8 = I cannot exercise because of disability

PA12 ***How physically strenuous is your work?***

1 = very light (mainly sitting)

2 = light (mainly walking)

3 = medium (lifting, carrying light loads)

4 = heavy manual work (climbing, carrying heavy loads)

PA13 ***During the last year (12 months) have you been advised by any of the under-mentioned to increase your physical activity?***

	<i>Yes</i>	<i>no</i>
<i>A doctor</i>	<i>1</i>	<i>2</i>
<i>Other health care personnel</i>	<i>1</i>	<i>2</i>
<i>A family member</i>	<i>1</i>	<i>2</i>
<i>Other</i>	<i>1</i>	<i>2</i>

E. Diet

Each project team should develop its own questions on dietary habits. These questions should target the local dietary aspects that are of control importance to NCD prevention (amount and quality of fat, salt, sugar, fruit and vegetable etc). When feasible, this should be supplemented by nutrition surveys.

F. Awareness and treatment of hypertension, diabetes and hypercholesterolaemia

F1. Awareness and treatment of hypertension

HBP1	<i>When was your blood pressure last measured by a health professional?</i> <i>1 = Within the past 12 months</i> <i>2 = 1-5 years ago</i> <i>3 = Not within the past 5 years</i>	___
HBP2	<i>Have you been told by a health professional in the past year (12 months) that you have elevated blood pressure or hypertension?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	___
HBP3	<i>Are you currently taking medication prescribed by a doctor to lower your blood pressure?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	___
HBP4	<i>Has a doctor in the past year advised you to change your lifestyle, in order to lower your blood pressure?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	___

F2. Awareness and treatment of hypercholesterolaemia

HCL1	<i>When was your blood cholesterol last measured?</i> <i>1 = Within the past 12 months</i> <i>2 = 1-5 years ago</i> <i>3 = Not within the past 5 years</i>	<input type="checkbox"/>
HCL2	<i>Have you been told by a health professional in the past year (12 months) that you have raised/elevated blood cholesterol or hypercholesterolaemia?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	<input type="checkbox"/>
HCL3	<i>Are you currently taking medication prescribed by a doctor to lower your blood cholesterol?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	<input type="checkbox"/>
HCL4	<i>Has a doctor advised you to change your diet and other lifestyles in order to lower your cholesterol?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	<input type="checkbox"/>

F3. Awareness and treatment of diabetes mellitus

DIAB1	<i>Have you ever been told by a doctor that you have diabetes?</i> <i>1 = Yes</i> <i>2 = No</i> <i>3 = Uncertain</i>	<input type="checkbox"/>
DIAB2	<i>Are you currently taking insulin or pills to control diabetes?</i> <i>1 = Yes, pills (no insulin)</i> <i>2 = Yes, insulin</i> <i>3 = No</i> <i>4 = Uncertain</i>	<input type="checkbox"/>

Reference

1. Methodology for a health behaviour survey -- CINDI health monitor questionnaires. WHO/EURO, Copenhagen. <http://www.who.dk/document/Chr/cinheamonquest.pdf>
2. CINDI HEALTH MONITOR--Proposal for Practical Guidelines. WHO/EURO and National Public Health Institute, Finland. 2001. <http://www.ktl.fi/eteo/finbalt/guidelines.pdf>.
3. European Health Risk Monitoring (EHRM). The European Commission's (EC) Health Monitoring Programme (HMP). 2002. <http://www.ktl.fi/publications/ehrm/product2/title.htm>.
4. WHO/EURO EUROHIS study. <http://www.iph.fgov.be/epidemiologie/crosphen/hisen/his04en/draft04.pdf>
5. Diabetes and noncommunicable disease risk factor surveys - *a field guide*. WHO/Geneva. WHO/NCD/NCS/99.1.
6. STEPS Field Manual. Part II. Question by Question Instruction Guide. WHO/NMH/CCS/03.05. 2003

ANNEX B: Method of population survey

To meet the minimum statistical requirements for assessing changes in the targeted behavioural and biological risk factors in the population, a risk factor survey should be carried out in the intervention and reference areas. The basic requirements for population sampling are as follows:

1. Sample size

At least 200 subjects should be examined in each of the sex and age groups listed in table AB1; the 15-24 year group is optional. The calculations are based on the following assumptions:

- 1) Significance level ($= 0.05$)
- 2) Power of test ($= 0.20$)
- 3) Simple random sampling
- 4) Different samples chosen at each survey
- 5) Definite changes in risk factor levels (cholesterol, blood pressure and smoking habits)

Table AB1: Minimum Sample Size of a Population Survey

Age (Years)	Male	Female
15-24	200, if possible	200, if possible
25-34	200	200
35-44	200	200
45-54	200	200
55-64	200	200
Total	800 (or 1000)	800 (or 1000)
Grand total	1600 (or 2000)	

It is recommended that the surveys of risk factors (including both biological and behavioural) should take place at the outset of the project (baseline survey) and thereafter in the fifth year (terminal survey). The project may of course be continued with further population surveys. The successive surveys should select different individual members of the population for sampling.

2. Approach to population survey

The population survey may take the form of a postal questionnaire followed by a medical examination, or of a telephone call or personal visit with an invitation to visit the investigating centre. A larger population might be surveyed by using a questionnaire.

3. Standardization, quality control and bias avoidance

The differences in risk factor levels that are to be detected over a period of 15 years may be quite small. The chances of not detecting them, or of producing spurious differences, will be increased if poor or changing techniques of measurement are used over time. The study will constitute a valid exercise only if a very painstaking approach to quality control is adopted.

This means that:

- 1) all observers should be trained and tested before starting work;
- 2) they should be re-tested during the study and any decline in performance should be remedied;
- 3) procedures should be rigidly adhered to and not changed either during or between successive years; for example, procedures should be repeated at the same time of the year to eliminate seasonal variation.

For details of measurement methodology and quality control procedures, please refer to:

- 1) EHRM, <http://www.ktl.fi/ehrm/copyright.htm>
- 2) MONICA manual, part iii: population survey, <http://www.ktl.fi/publications/monica/manual/part3/iii-1.htm>
4. Diabetes and noncommunicable disease risk factor surveys - *a field guide*. WHO/Geneva. WHO/NCD/NCS/99.1.

ANNEX C: Key messages, intervention strategies and activities

1. Key messages, intervention strategies and activities for tobacco use

Key messages	Strategies	Activities
<ul style="list-style-type: none"> – Avoid using tobacco in any form as it harms health in many ways – If you do not smoke, ensure that you stay that way; don't experiment with it, as nicotine is an addictive drug – If you are using tobacco in any form, do your best to give up the habit as this will reduce your health risks – Don't let yourself or your family be exposed to tobacco smoke from others – Don't smoke in the presence of your children, other family members and friends, as the smoke will harm them too. – Don't smoke or permit others to smoke in public places – Pregnant women particularly should not be exposed to tobacco smoke, as it harms the unborn child 	A. Education	<ol style="list-style-type: none"> 1. Mass media: TV, print media 2. Community networks, RWAs, health NGOs, development NGOs. 3. Special group settings: women, school children, youth groups 4. Work places opinion makers
	B. Environment (including policy)	<ol style="list-style-type: none"> 1. Effective warning signs 2. Tobacco-free schools 3. Tobacco-free workplaces 4. Tobacco-free homes 5. Ban tobacco advertising 6. Tobacco taxation 7. Ban on smoking in public places 8. Legislation for the protection of minors
	C. Service	<ol style="list-style-type: none"> 1. Tobacco cessation programmes 2. Anti-tobacco education at health facilities 3. Advice and counselling to stop tobacco use 4. Tobacco cessation as part of secondary prevention 5. Health care providers 6. Methods of prevention

2. Key messages, intervention strategies and activities for diet

Key messages	Strategies	Activities
<ul style="list-style-type: none"> – Reduce the amount of unhealthy fats in your diet (giving examples of the common sources of saturated fats and trans-fats in your country) – Reduce the amount of salt in your diet (in cooking, at the table and through processed foods) – Increase the amount of fruit and vegetables in the diet, make them a regular part of the diet (preferably five servings a day) – Increase the amount of fish consumed in your diet (preferably twice a week or more) – Eat in moderation so that the diet provides adequate energy according to your age and activity levels – Avoid over-eating or consuming high-calorie foods (such as high-sugar or high-fat foods) so as to avoid excessive weight gain. 	<p>D. Education</p>	<ol style="list-style-type: none"> 1. Mass media: TV, radio, print media 2. Community networks; RWAs, health NGOs, development NGOs 3. Special group settings; women, school children, youth groups 4. Workplaces opinion makers, food industry
	<p>E. Environment (including policy)</p>	<ol style="list-style-type: none"> 1. Local production of fruits and vegetables 2. Local production of low fat dairy products 3. Local action on salt, saturated fats, trans-fats in processed/manufactured foods 4. Food prices, distribution and labelling 5. Changes in school cafeterias, canteens 6. Changes in workplace cafeterias, canteens 7. Incentives and disincentives addressed to food industry, shops, restaurants
	<p>F. Service</p>	<ol style="list-style-type: none"> 1. Nutrition and counselling 2. Services in health care facilities 3. Demonstration/training programmes for healthy cooking 4. Support from the agricultural department for community/school farming (fruit and vegetable) 5. Support from fisheries department for increasing fish supply 6. General public, schools, industries, taking local characteristics into account

3. Key messages, intervention strategies and activities for physical activity

Key messages	Strategies	Activities
<ul style="list-style-type: none"> – Regular moderate physical activity (such as brisk walking for 30 minutes a day – at a stretch or accumulated in three 10 min periods) should become part of your daily routine. Such activity protects your health – Vigorous physical activity also promotes fitness, but it is not the only way to achieve health benefits – Simple daily activities (like walking or cycling to work or markets, climbing stairs and doing vigorous household work) will help you to become more physically active and protect your health 	A. Education	<ol style="list-style-type: none"> 1. Mass media; TV, radio, print media 2. Community networks; RWAs, health NGOs., development NGOs 3. Special group settings; women, school children, youth groups 4. Work place opinion-makers
	B. Environment (including policy)	<ol style="list-style-type: none"> 1. School facilities (time, infrastructure, training) for RPA 2. Workplace facilities (time, infrastructure, training) for RPA 3. Community facilities (time, infrastructure, training) 4. Safe pedestrian paths 5. Safe cycling tracks 6. Elevator policy in buildings 7. Sports (infrastructure, training)
	C. Services	<ol style="list-style-type: none"> 1. Urban planning design 2. Urban transport 3. Physical activity as part of health and rehabilitation programmes 4. Department of education 5. Department of sports

4. Key messages, intervention strategies and activities for high blood pressure

Key messages	Main activities
<ul style="list-style-type: none"> – High blood pressure damages health in many ways and can result in heart attacks, paralytic attacks, kidney failure and other serious illnesses – High blood pressure can be lowered by reducing salt in the diet, avoiding alcohol, eating more fruit and vegetables, eating less fat, exercising regularly and reducing body weight. Drugs may also need to be used in some cases, but only under medical supervision – Blood pressure should be measured regularly, the frequency of such a check-up should increase with age – the elderly should have check-up at least once a year. 	<ol style="list-style-type: none"> 1. Community education (for recognition + self-referral) 2. Integrating blood pressure measurements in services 3. Training of health personnel in measurement and control 4. Diagnostic and management algorithms (for risk stratification) 5. Management algorithms (for cost-effectiveness) 6. Availability of essential blood pressure-lowering drugs

5. Key messages, intervention strategies and activities for high blood cholesterol

Key messages	Main activities
<ul style="list-style-type: none"> – Blood cholesterol is a predictor of heart disease. High levels of blood cholesterol lead to fat deposition in the blood vessels and can cause heart attacks – A healthy diet (low in animal and dairy fats and hydrogenated oils) will help to avoid excess blood cholesterol levels – If blood cholesterol is elevated, drugs are sometimes required along with diet to reduce the cholesterol and prevent heart and blood vessel disease – If you are a man aged over 35 years or a woman aged over 45, you should have your blood cholesterol checked. 	<ol style="list-style-type: none"> 1 Community education (for recognition + self-referral) 2 Integrating blood cholesterol measurements (venous or finger tip) in health services 3 Care provider education (counselling) 4 Diagnostic and management algorithms (for risk stratification) 5 Availability of cholesterol-lowering foods 6 Availability of anti-lipid drugs.

6. Key messages, intervention strategies and activities for diabetes

Key Messages	Main activities
<ul style="list-style-type: none">- Diabetes should be treated effectively to prevent complications- Diabetes increases the risk of heart attacks, stroke, kidney damage, visual loss, foot ulcers, leg gangrene, infections and other illnesses- A person who is overweight, or has family members with diabetes, should have himself or herself checked for diabetes or predisposing conditions- People with diabetes or at a high risk of diabetes should exercise regularly, eat a healthy diet and avoid tobacco. This helps to prevent diabetes in predisposed persons and to control it better in affected persons, and it reduces the risk of complications.	<ol style="list-style-type: none">1. Community education (for recognition + self-referral)2. Care provider education (for targeted screening)3. Diagnostic and management algorithms (for risk stratification)4. Availability of anti-diabetes drugs (for cost-effective care of diabetes and complications)

ANNEX D: Example of the project plan

Introduction to Isfahan Healthy Heart Programme

The Isfahan Healthy Heart Programme (IHHP) is a comprehensive integrated community-based intervention programme for the prevention and control of noncommunicable diseases. The programme began in late 1999 and will last until 2006. The intervention communities are Isfahan and Najafabad (rural and urban areas) in the central part of Iran (1,900,000 population). Arak has been selected as the reference community (about 700,000 population).

1. Goal and Objectives

1.1 Goal

To improve NCDs prevention and control and promote healthy lifestyles in the Intervention Community.

1.2 Objectives

- (1) Assessment and comparison of the prevalence of NCD risk factors in the first and final phases of the programme (intervention versus reference communities).
- (2) Assessment and comparison of the prevalence of some NCDs (coronary artery diseases, stroke, diabetes mellitus, and hypertension) in the first and final phases of the programme (intervention versus reference communities).
- (3) Assessment and comparison of the annual incidence of coronary arterial diseases and stroke in the first and final phases of the programme (intervention versus reference communities).
- (4) Assessment and comparison of cardiovascular causes of mortality rate in the first and final phases of the programme (intervention versus reference communities).
- (5) Assessment and comparison of morbidity from coronary arterial diseases and stroke in the first and final phases of the programme (intervention versus reference communities).
- (6) Assessment and comparison of trends of the general population's BASK about NCDs and their risk factors between intervention and reference communities.
- (7) Assessment and comparison of trends of health professionals' BASK

about NCDs and their risk factors between intervention and reference communities.

- (8) Assessment and comparison of trends of CVD patients' and high-risk populations' BASK about NCDs and their risk factors between intervention and reference communities.
- (9) Drawing up the CVD risk chart for Iranian society and related risk assessment.

2. IHHP phases

The Isfahan healthy heart programme is designed in three phases:

2.1 Phase I - Situation analysis: Identification of the intervention and reference populations

This first phase of the programme, which includes mainly community diagnosis, evaluates the characteristics of the population and the distribution of variables selected as programme indicators in random samples of the two intervention populations (Isfahan and Najafabad) and the control population (Arak).

2.2 Phase II - Implementing population interventions and periodical evaluations

In this phase, the population strategies for interventions are designed and performed within the framework of nine projects in the entire intervention communities (Isfahan and Najaf Abad). Evaluation at the formative and process levels is performed simultaneously with continuous implementation of interventions and within defined timeframes in intervention areas. Impact evaluation is conducted annually in both intervention and reference communities.

2.3 Phase III - Final programme evaluation

In this phase, based on the above-mentioned objectives of the programme and as in phase I, data and indicators corresponding to the objectives are collected from independent random samples from both intervention and reference communities. Data are analysed and compared between the two societies. The overall efficiency and effectiveness of the programme are shown in this phase and the risk chart of the population is also drawn up. This phase of the programme is scheduled for the first half of 2006.

Programme evaluation is done at four levels (formative, process, impact and outcome). While outcome evaluation is done at the beginning and in the last phase of IHHP on independent random samples in both communities, impact evaluation on BASK about diseases and their risk factors is conducted annually on independent samples from the two communities.

3. Main Strategies and Domains for Interventions

3.1 The four main areas of intervention are as follows:

- (1) Healthy nutrition
- (2) Increased physical activity
- (3) Tobacco control activities
- (4) Dealing with stress and tensions.

3.2 The intervention criteria are as follows:

- (1) Simplicity, feasibility and cost-effectiveness
- (2) Applicability to large populations
- (3) Exploiting available resources and facilities
- (4) Possibility of integration into the health care system, and implementation as part of the responsibilities of health professionals
- (5) Sustainability of activities
- (6) Possibility of being readily carried out at the national level
- (7) Possibility of being evaluated.

3.3 Main strategies

- (1) Focusing on main NCD risk factors
- (2) Focusing on all prevention levels (primordial, primary, secondary and tertiary) for NCD prevention and control
- (3) Carrying out comprehensive integrated interventions using population and high-risk approaches
- (4) Introducing suitable models applicable to other parts of the country, and to developing nations in general, for correcting unhealthy lifestyles.

4. IHHP Projects

4.1 Heart Health Promotion from Childhood

4.1.1 Target Population

Children and adolescents younger than 18 years, parents, school and kindergarten administrators.

4.1.2 Objectives:

- (1) Improving BASK about prevention and control of NCD risk factors from an early age
- (2) Providing integrated facilities in the existing system in schools and kindergartens to correct lifestyles
- (3) Contributing to development of healthy lifestyles from an early age.

4.1.3 Activities:

- (1) Conveying health messages on healthy lifestyles to parents via the children
- (2) Correcting unhealthy eating habits to prevent nutritional disorders
- (3) Increasing scientific potential and encouraging avoidance of NCD-predisposing factors from childhood and adolescence, and creating the ability to withstand the influence of negative advertising later in life.

4.2 Youth Healthy Heart Project

4.2.1 Target Population

Youth aged between 19 and 25 years.

4.2.2. Objectives:

- (1) Improving BASK about NCDs and risk factors among youth
- (2) Modifying lifestyles (i.e. smoking cessation, increasing physical activity, coping with stress, and healthy nutrition)
- (3) Reducing NCD risk factors in youth.

4.2.3 Interventions

- (1) Education: Group education, face-to-face education, the use of learning aids such as pamphlets, brochures, posters, educational leaflets, using mass media, including radio and television, to communicate educational guidance
- (2) Introducing healthy patterns of behaviour, promoting the culture of cycling at university, and organizing recreational and scientific camps
- (3) Legislating and ensuring strict observance of anti-smoking regulations in universities, discouraging the use of automobiles and creating bicycle tracks on university campuses

- (4) Using cultural and artistic activities (theatre and cinema) to raise awareness in regard to NCD prevention and control.

4.3 Healthy Life for Cardiovascular Patients Project

4.3.1 Target Population

Patients with definite diagnosis of ischaemic heart disease (IHD) or stroke and the high-risk group (population with at least one major risk factor like diabetes mellitus, hypertension, dyslipidaemia, smoking, positive family history for IHD or stroke).

4.3.2 Objectives:

- (1) Improve BASK of the target population about CVD risk factors
- (2) Reduce mortality in CVD patients (IHD or stroke)
- (3) Reduce morbidity in CVD patients (IHD or stroke)
- (4) Improve CVD patients' quality of life.

4.3.3 Activities:

- (1) In-hospital education for CVD patients about their disease, its complications, medication and healthy lifestyle changes
- (2) Educating the patients' relatives and families before discharge from CCUs and cardiology wards in hospitals, and offering them information on means of secondary or tertiary prevention
- (3) Holding cardiac rehabilitation sessions (in and out of hospitals) and providing all necessary education
- (4) Public education via mass media.

4.4 Women's Healthy Heart Project

4.4.1 Target population

Women in the intervention community.

4.4.2 Objectives:

- (1) Identification of NCD risk factors and behaviours regarding NCD in women, prior to and after interventions
- (2) Improving BASK of women in dealing with risk factors and healthy lifestyles for their families
- (3) Reducing NCD risks in high-risk individuals
- (4) Improving BASK of women in dealing with IHD patients.

4.4.3 Activities:

- (1) Activating field professionals from the health service system in areas such as education, arranging educational contests, face-to-face education of women referred to health houses and other health and treatment centres, organizing group activities, establishing educational kitchens
- (2) Educating marrying couples upon their referral to the health centres regarding healthy lifestyles
- (3) Motivating the cooperation of company illiteracy instructors to implement educational programmes in their literacy courses with regard to NCD risk factor prevention and healthy lifestyles
- (4) Motivating the cooperation of administrators of Municipal Culture Houses and health and treatment centres in holding practical courses on healthy cooking, cardiopulmonary resuscitation, and indoor exercise for women during seasonal educational terms
- (5) Motivating the support of mosque clerics (religious leaders) in educating people attending mosque services
- (6) Holding theoretical and field courses on healthy cooking, physical exercise and risks of passive smoking in women's theology schools, and conveying educational messages on these topics
- (7) Encouraging the family counsellors of the Imam Khomeini Relief Committee (a charity institute) to exploit supportive educational opportunities in their sessions with families.

4.5 Health Professional Education Project

4.5.1 Target Population

- (1) Physicians (cardiologists, internists, neurologists and general physicians)
- (2) Health workers and experts
- (3) Nurses
- (4) Medical students
- (5) Health volunteers and carers.

4.5.2 Objectives

Improving bank of health professionals about NCDs and their risk factors, and ways to bring about healthy lifestyle change.

4.5.3 Activities

- (1) Arranging educational seminars for the target population
- (2) Holding educational workshops for the target population
- (3) Establishing educational task groups comprising physicians, nurses, health instructors, etc.
- (4) Self-education of physicians (remote education using books and leaflets) which is approved by CME in Iran
- (5) Preparing educational books and leaflets (e.g. leaflets for distribution in seminars, the Healthy Heart book for nurses, educational booklets for health assistants).

4.6 Worksite Intervention Project

4.6.1 Target Population

Worksite employees (governmental and private offices, companies, factories, syndicates, etc.)

4.6.2 Objectives

- (1) Improving BASK of factory workers, office employees, workers in other trades in relation to risk factor prevention and control and healthy lifestyles
- (2) Improving BASK of workplace managers and directors in regard to NCDs and their risk factors.

4.6.3 Activities

- (1) Improving healthy cooking in the restaurants of worksites
- (2) Providing education on ways of coping with stress in the workplace
- (3) Physical activity and exercise-related interventions in factories and organizations by designating certain times for physical exercise and enforcing workplace exercise regulations; practical education
- (4) Advocating and enforcing non-smoking regulations in the workplace
- (5) Opportunistic screening of employees for hypertension and overweight obesity in offices, factories, etc.
- (6) Using data regarding biological indicators and NCD risk factors, if the project is ongoing in worksites.

4.7 Healthy Food for Healthy Communities

4.7.1 Target Population

General population, food industries, food providers, etc.

4.7.2 Objectives:

- (1) Carrying out and following up necessary interventions in organizations responsible for the supply of foodstuffs in the society, food-producing centres, food industries, and food outlets
- (2) Improving public BASK about healthy nutrition
- (3) Improving the status of nutrition in the society at large.

4.7.3. Activities:

- (1) Setting up healthy food stations (e.g. restaurants, sandwich shops, pizzerias, confectioners, bakeries, supermarkets, etc.)
- (2) Providing education on cooking healthy food in organizations, etc. which cater for their personnel
- (3) Modifying and improving cooking procedures in food industries; encouraging the production of higher-quality non-industrial food and low-salt bread, substituting yeast for sodium bicarbonate in bakeries, producing low-fat and low-sugar confections, producing low-fat dairy products
- (4) Enforcing existing regulations in the community on the sale of healthy foods to:
 - Encourage food industries to produce healthier products
 - Encourage the production and supply of liquid oil, reducing the production of hydrogenated oil and lowering consumption of trans-fatty acids
 - Passing the necessary regulations related to supply of healthy food products in stores
 - Passing regulations on labelling of food products
- (5) Educating and encouraging the public to buy and consume healthy food products, and to heed food labels
- (6) Publication and circulation of healthy food cookbooks
- (7) Arranging competitions with themes on choosing and making healthy food for healthy hearts
- (8) Producing and broadcasting educational television and radio programmes on healthy cooking.

4.8 Isfahan Exercise Project

4.8.1 Target Population

General population, sport clubs, exercise and training centres .

4.8.2 Objectives:

- (1) Improving the population's BASK in regard to regular daily exercise
- (2) Decreasing air pollution
- (3) Providing suitable physical exercise environments for different age and sex groups for regular daily exercise.

4.8.3 Activities:

- (1) Arranging healthy heart exhibitions and holding sports events in some streets while closing the street and prohibiting private transport
- (2) Educating the society via radio and television programmes about the benefits of doing regular daily exercise
- (3) Providing education on equivalent physical exercises that can be carried out by housewives at home and by employees in the workplace
- (4) Altering the prevailing models and habits toward a more physically active society
- (5) Enforcing regulations about exercise in schools and the workplace
- (6) Promoting the culture of biking and walking; making bicycle tracks and encouraging people to ride rather than drive
- (7) Holding sports competitions that encourage participation by women, men, children and adolescents.

4.9 NGOs and Volunteers in IHHP

4.9.1 Target Population

Non-governmental organizations, volunteers (health workers, Red Crescent etc).

4.9.2 Objectives:

- (1) Improving BASK of NGOs, health workers and other volunteers in relation to NCDs risk factors and healthy lifestyles
- (2) Organizing NGO activities in regard to risk factor prevention and healthy lifestyles.

4.9.3 Activities:

- (1) Arranging educational sessions for NGOs' members and officials and health volunteers concerning risk factor prevention and healthy lifestyle changes

- (2) Studying the existing activities conducted by those NGOs or volunteers whose objectives include healthy lifestyles
- (3) Implementing joint educational activities (materials, face-to-face, mass media, etc.) or services regarding risk factor prevention and control
- (4) Establishing and empowering the NGOs with main objectives of primary and secondary CVD prevention and healthy lifestyle change (e.g. Iranian Chapter of Heart Friends around the World, the food industry, healthy community groups, Iranian Heart Foundation, etc).

School-based suicide prevention programs tend to have the following goals in common: • heighten awareness of the problem • promote case finding (i.e., teaching teachers and especially other students to identify those who are at risk; increase disclosure of suicidal ideation by decreasing stereotypes that may cause stigma) • provide staff and students with information about mental health resources • specifically how they operate and. • Evaluation evidence on the effectiveness of selective programs is limited. • Evidence suggests that selective programs targeting high-risk young people in a school setting are most likely to be effective. • KiVa is a school-based bullying prevention programme with universal and indicated elements and an emphasis on changing bystander behaviour. It achieved promising results in a large trial in Finland, and now requires testing in other countries. This paper describes the protocol for a cluster randomised controlled trial (RCT) of KiVa in Wales. The study uses a two-arm waitlist control pragmatic definitive parallel group cluster RCT design with an embedded process evaluation and calculation of unit cost. Participating schools will be randomised a using a 1:1 ratio to KiVa plus usual provision (in