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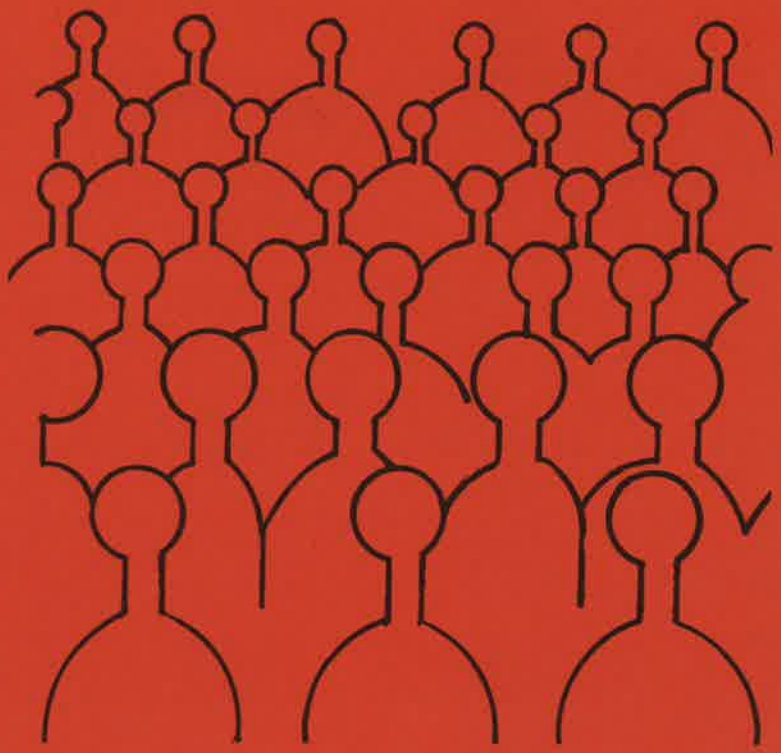
MONITORING OF TRENDS AND DETERMINANTS OF CARDIOVASCULAR DISEASES IN FINLAND (PART OF A JOINT WHO STUDY) — THE MONICA PROJECT

CONTENTS:



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NATIONAL PUBLIC HEALTH INSTITUTE
Helsinki, FINLAND

MONITORING OF CARDIOVASCULAR DISEASES AND THEIR RISK FACTORS IN THE COMMUNITY LEVEL (FINNISH PART OF A JOINT WHO STUDY) - THE MONICA PROJECT

CONTENTS:

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MONICA PROJECT, FINLAND

I GENERAL PROTOCOL OF THE PROJECT

National Public Health Institute
Department of Epidemiology
Helsinki, 1981

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1. BACKGROUND

Cardiovascular disease (CVD) mortality varies greatly between different countries. Clear differences have also been observed in many countries in time trends both for total mortality and for cardiovascular disease mortality. Although cerebrovascular disease mortality has decreased in most industrialized countries, the changes in coronary heart disease (CHD) mortality has been considerably different across countries. In some countries CHD mortality has clearly started to decrease whereas in other countries it has increased. There are also countries where CHD mortality has remained the same. In most countries the changes for both men and women are similar and can be observed even in the youngest age-groups.

The observed changes in mortality are based mainly on routine death statistics. Information on the changes in non-fatal disease is lacking. For this reason it cannot be said whether the change in mortality is related to a change in the incidence of the disease or to its prognosis. The factors explaining the clearly different development in CHD mortality in various countries are not known either.

In Finland CHD mortality in both men and women increased strongly from the 1950's to the mid-1960s and decreased in the 1970s. There are regional differences in CHD mortality and morbidity within lower mortality rates in West and South-West Finland than in East Finland. The increase in coronary artery disease mortality until late 1960s seem to have occurred in a fairly parallel manner in the different areas.

The diagnosis and care of cardiovascular diseases in Finland has changed considerably in the past few years. The medical treatment of hypertension has become effective and the early and late treatment of acute myocardial infarction (MI) have improved. Smoking among men declined since the beginning of the 1960s and nutritional habits also seem to be changing;

the consumption of milk products and especially butter fats has declined. It is not possible, however, to say at this time which factors have caused the favourable changes in CHD in the 1970s. A thorough knowledge of these factors would be of primary importance in understanding the causes of cardiovascular diseases and the possibilities for preventing them. This information is needed by both researchers in this field as well as by authorities responsible for making health policy.

In addition to official mortality statistics it is possible to follow CVD in Finland with the help of a register based on hospital discharges and through the disability pensions awarded by the National Pensions Institute. The use of discharge report records in following CVD morbidity rates is problematic. There are, for example, surprisingly sharp fluctuations in the number of CHD cases even within short periods. This is apparently related to changes in diagnostic and treatment practice. Thus at this time, discharge records provide only a partial view of the changes in CVD morbidity.

A so-called myocardial infarction (MI) register has been in operation in several localities in Finland, originally in Helsinki and Tampere, later in Turku and in North Karelia. This has been used to register all deaths from CHD and cases of MI which lead to hospital treatment in the population of the registered area. The MI registers were started in the beginning of the 1970s and were co-ordinated by the European regional office of the WHO. In 1980 only the North Karelia and Turku registers were still in operation. Similar registering activities for stroke were carried out for a brief period in the beginning of the 1970s in Espoo and has continued since 1972 in North Karelia.

The level of the CVD risk factors in the Finnish population has been investigated in many studies. The broad population studies carried out by the National Pensions Institute have provided a relatively good cross-section of the population risk factor levels. Far-reaching risk-factor surveys have been carried out in East Finland as the part of the North Karelia project. Also an east-west comparison was made in the initial studies of the project. Longitudinal follow-up studies of risk

factor levels in East Finland have been central part of the project. These studies have consistently noted the high mean levels of the so-called "known risk factors" in the Finnish population. There are also tentative suggestions that changes in risk factors levels correspond with the improving trend in the CHD situation.

The WHO has prepared an international joint study to supplement previous cross-sectional studies of differences in MI and stroke morbidity with a longitudinal study. The aim of this project is to simultaneously follow CVD mortality and morbidity, population risk factor levels and health behaviour and treatment practices in addition to certain social factors in defined populations during a sufficiently long period of time. By following these developments in countries with different directions of change we may be able to draw conclusions regarding the etiologies of these changes.

The aim of the Finnish monitoring project is to follow mortality and morbidity in major cardiovascular diseases as well as the development of risk factors and other background factors in a higher and a lower morbidity area. The project also implies participation in the international joint study co-ordinated by the WHO.

2. AIMS AND OBJECTIVES

The aim of the study in Finland is to follow the development of CVD and total mortality as well as MI and stroke incidence rates in communities selected for study in East and West Finland. A further aim is to investigate the degree to which the development of disease is associated with changes in known risk factors, the health behaviour of the population and treatment as well as the major socioeconomic factors. An aim of the study is also to have Finland participate in the respective international WHO project (the MONICA project).

The study goal is to investigate which of the following hypotheses are valid: A possible change in CVD mortality is linked to a change in:

1. the severity and prognosis of CVD (fatality).
2. the incidence of CVD, or
3. both of the above.

If the severity and prognosis of CVD, that is, the fatality of the early stage of the diseases and/or the long-term survival after the diseases appear to change, this may be the result of changes in a) treatment practices, b) spontaneous change in the severity of the diseases or c) in both of the above.

A change in the CVD incidence may be related to a change in risk factors such as:

a) smoking,
b) the blood pressure level of the population (changing according to environmental changes and/or to the follow-up and treatment of persons with high blood pressure),
c) the lipid levels of the population, in connection with
d) nutritional habits (changes in calories and the use of saturated and polyunsaturated fats, cholesterol and salt) and
e) relative body weight and exercise
f) combinations of the above risk factors. (Perhaps even small changes in several factors lead to a large change in overall risk.)

Because parallel but not causal random changes may be observed between the trends in certain factors, direct causal conclusions cannot be reached on the basis of one or a few monitoring areas (study units). On the other hand carrying out the study in many centres increases the possibilities of detecting cause and effect -relationships and estimating the reliability of their strength.

The major null-hypotheses of the international study are:

1. mortality trends of coronary artery disease are not related to case-fatality trneds and
2. the incidence trends of coronary artery disease are not related to changes in the levels of the major risk factors (smoking, serum cholesterol and blood pressure or combination of these).

It can further be said that

3. the incidence trends of stroke are not related to changes in blood pressure level.

The monitoring areas chosen in Finland are the county of North Karelia in East Finland, where there are already disease registers in operation and where a follow-up study of morbidity development is important because of the North Karelia project (population base c. 175 000), and in West Finland in the city of Turku and a group of municipalities in the Loimaa region. Turku, where there is a MI register already in operation, has a population of 170 000. The municipalities of the Loimaa region have been included to expand the monitoring area to rural municipalities. These municipalities have a population of about 40 000. These use the Loimaa regional hospital as their primary hospital nearly without exception.

3. GENERAL DESIGN

The project can be divided into three main parts: 1) monitoring of MI and stroke incidence and mortality rates with disease registers and death data in the monitoring areas, 2) monitoring of the levels of CVD risk factors and other related factors in the monitoring areas with surveys of random population samples with risk factor measurements every five years and with small annual surveys by mail and 3) the development and validation of a regional monitoring system for CVD morbidity and mortality based on the hospital discharge reports and death certificates.

3.1. Monitoring the incidence and mortality of MI and stroke

The situation in 1980

A stroke register was in operation in Finland in North Karelia and MI registers were in operation in North Karelia and in the city of Turku. The diagnostic classification of the MI cases used at both centres was based on the recommendations for the WHO MI register study. In North Karelia data was collected both from the North Karelia Central Hospital and the health centres. In the city of Turku heart attacks are all treated

at the University Central Hospital of Turku. A nurse and a ward assistant collected data for the registers. In North Karelia the salaries of the register personnel were paid by the central hospital and in Turku by the city. Trained nurses in the North Karelian health centres collected the primary data on the patients treated there.

The data processing for the Nroth Karelia registration was carried out at the computer centre of the University of Kuopio. In Turku the city was responsible for the data processing of the register information.

The data collection for the stroke register operating in North Karelia was carried out in the health centres by the same nurses as for the MI register and at the central hospital by the department of neurology. There were no specially designated nurses at the central hospital for this purpose. The diagnostic classification of stroke cases was based on clinical practice and hospital diagnoses. The collected data was sent directly to Kuopio from the place of treatment.

Preparatory stage in 1981

In the beginning of 1981 a stroke register was started in the Turku city area and MI and stroke registers were started in the Loimaa region. At the same all registers changed over to the use of a nationally uniform record form. Also at the same the collection of data on all deaths was begun in the monitoring areas. All data processing was started to be carried out by the National Public Health Institute (in practice at the computing centre of the University of Kuopio). The National Public Health Institute co-ordinated the operation of the registers and the introduction of standardized methods by arranging several meetings for persons responsible for the registers in the different areas. After the international meeting of the WHO in October 1981 it was agreed to make some further changes in methods and criteria in accordance with the final international protocol. This would begin in 1982.

Implementation of the monitoring since beginning of 1982

The registering and data collection of MI and stroke cases is carried out in the North Karelia, Turku and Loimaa areas essentially the same as in

the past. In the monitoring areas acute MI cases (persons under 65) and stroke cases (persons under 75) are registered from among the population permanently residing there. New attacks within a period of 28 days for the same person are counted as the case. Uniform methods and the same register record forms are used in all areas. The data collection (register) system in each area collects standardized data on the possible cases of MI and stroke. This includes data on diagnostic criteria, which is used in the final classification of the case carried out by the local register centre.

Sources for tracing possible cases are the following:
- admission and discharge information from hospitals
- death certificates
- discharge report data
- laboratory files
- (health insurance data)

The information on the cases is collected from case reports (or other hospital sources) and from interviews with patients and their relatives.

The reason for limiting the registration of MI to persons under 65 (as according to the WHO protocol) is the relative unreliability of data on diagnostic criteria for older persons as well as the lesser significance of MI for public health in the old age. As nearly 75 % of all stroke cased involve persons over 65, it is not reasonable to limit the registering to persons under 65. Thus the registration applies to persons under 75.

Data on deaths are continuously collected directly from the monitoring areas using death certificates. These data are used in monitoring mortality rates (total mortality, disease-specific mortality) and as supplementary information for case finding.

The register thus count primary attacks, not persons. Attacks suffered by the same person are linked by the social security number (health insurance code number).

The methods and criteria of MI and stroke registering

The registering and data collection of MI and stroke cases are carried out in the Turku, Loimaa and North Karelia areas with uniform methods and criteria and based on WHO protocol. For possible MI and stroke cases the basic information is recorded on the form as soon as possible. The follow-up part of the record form is filled in when the patient dies, is discharged from hospital or after 28 days have elapsed at the latest. If the patient dies during this period the parts of the form for death information will also be completed.

The data to apply the diagnostic criteria are collected as thoroughly as possible from the registered heart attack cases. On the basis of these data the cases are then classified according to WHO criteria. The coding and application of the criteria and the classification of the cases are carried out in a centralized way by one register doctor in each local register centre (Joensuu, Turku, Loimaa).

This diagnostic classification attempts to eliminate "false positive" cases. By collecting data in a recommended manner also on some cases defined as other diagnoses by clinic or death records most of the "false negative" cases will also be registered.

The register can not detect so-called "silent MIs" or cases that have not come to the attention of the health care system. Changes in the seeking of treatment and/or of health services can thus cause a bias in the observed trends. The attempt is to eliminate this problem by keeping recording practices as similar as possible throughout the study or by at least observing possible treatment and service changes.

The MI register record form contains information on the following groups of variables:

- demographic factors
- place of treatment
- former work, smoking, blood pressure and MI history
- history of the attack
- events during hospital treatment
- the situation at 28 days' follow-up

- diagnostic criteria and classification
- weight, height, serum cholesterol, serum enzymes
- death data

The MI diagnostic criteria are in accordance with criteria agreed upon in the WHO international protocol agreed in 1981. These have been defined in quantitative terms as exactly as possible and are to a great extent in agreement with criteria used earlier in the registration in North Karelia.

Each registered case of suspect AMI (acute myocardial infarction) is classified according to diagnostic criteria to one of the following classes:

1. definite AMI
2. possible AMI or coronary death
3. primary ischemic cardiac arrest with successful resurscitation not fulfilling criteria for definite or possible AMI
4. no AMI or coronary death
5. fatal cases with insifficient data.

There is a separate detailed register manual on the criteria used and the general operation of the MI register.

The data of the stroke register contains the following variables:

- demographic factors
- place of treatment
- previous place of residence and work ability, history of blood pressure, MI and stroke
- history of the beginning of the attack
- diagnostic examinations and rehabilitation
- the situation at 28-days' follow-up
- clinical diagnosis and diagnostic conclusions of register
- death data

The registering of stroke cases is based on clinical diagnosis: cases with a clinical diagnosis (according to the ICD code) of 430-438 are parimarily evaluated. In the final evaluation stroke cases are defined

as attacks with rapidly developing symptoms of focal (and sometimes global) disturbances in cerebral activity which last at least 24 hours or lead to death and which have no other apparant cause.
The clinical symptoms and findings of the patients are thus suggestive of subarachnoid hemorrhage, cerebral hemorrhage or cerebral infarct. TIA attacks of chronic non-fatal disturbances of cerebral blood circulation are not registered as cases. The clinical diagnosis of the stroke cases is usually 430-434 or 436.
There is also a separate detailed register manual on the diagnostic criteria and methods of the stroke register.

A postal inquiry is sent to the person registered in the MI register after a year. In this, information on survival, return to work, health habits as well as physical and psychological rehabilitation of the subject is inquired. If several registered attacks occur during the year, the yearly follow-up is carried out only for the first attack during the year. In order to detect death persons registered for MI or stroke are followed by means of death certificate data for at least three years after the initial registered attack.

3.2. Monitoring of CVD risk factors and other related factors

Yearly surveys using precoded questionnaires are carried out by mail in the areas to monitor the health behaviour and related features of the population. At the beginning of the project period (1982), mid-way (1987) and at its end (1992), field studies are carried out to measure the risk factor levels of the population and to collect other relevant information. These studies apply to the 25-64 years old population resiging premanently in the monitoring area (both males and females).

In the yearly postal survey information is gathered on the health habits of the population, the use of health services, socio-economic living conditions, and subjective health. The selection of variables is based on the system of follow-up of health behaviour of adult Finnish population, as carried out by National Public Health Institute. The sample size of the postal survey is about 1200 persons in both North Karelia and South West Finland.

According to the sample size estimations of the field study about 400 persons are to be studied each time in each 10-year age and sex specific group in each monitoring area. Thus a random population sample of about 4000 persons is selected from each monitoring area (estimating 80 % participation). The city of Turku and the municipalities of the Loimaa region where registering is carried out are regarded as one monitoring area. In this way a sample of about 8000 persons for each field risk factor study is taken for the whole study. The sampling is done randomly but staratified according to sex, 10-year age group and monitoring area (North Karelia and Turku + Loimaa region) and carried out by computer from the national population register.

In the risk factor field survey the conventional CVD risk factors are measured and questionnaire data is collected on health behavior, health knowledge and attituedes, the use of health services etc. The recommendations of the WHO protocol are taken into account as thoroughly as possible as well as internationally accepted recommendations on measurement techniques.

The variable groups to be measured in the risk factor field survey include:
- smoking (and thiocyanate)
- blood pressure and blood pressure treatment
- nutrition habits and use of alcohol (plus serum g-GT)
- serum cholesterol (total cholesterol, HDL-cholesterol)
- weight and height
- other forms of health behaviour (e.g. exercise)
- demographic factors
- socioeconomic factors
- health knowledge, psychosocial stress
- symptoms and subjective health (e.g. MI, diabetes)
- use of health services and certain medicines (including contraceptive pills)
- sodium, potassium and creatinine in a 24-hour urine (in a subsample)
- 3-day food consumption diary (in a subsample)

The questions in the questionnaire are based on recommendations of the WHO, the preveious experiences in the North Karelia project and other studies.

Blood pressure is measured with auscultation using a long cuff. The fifth phase is used as diastolic pressure. Measurements are carried out twice after five minutes rest with the subject in a sitting position (pulse is taken between measurements).

The field studies are carried out by trained survey teams (four groups of 3 research assistants) comprised of nurses. The survey teams cross over between areas. The persons to be examined are invited to the local health centres where the questionnaires, completed already at home, are checked and supplementary interviews are carried out. Blood samples are taken and physical measurements are made. About 50 persons are examined in the course of one day. Thus the field study lasts about three months. The field studies are carried out each time during winter and early spring.

The venous blood samples are centrifuged at the examination place and the serums are sent to the central laboratory for analysis. The analyses are carried out continuously from fresh samples in the central laboratory in large series in which the order of samples is random with respect to monitoring area.

There is a separate detailed survey manual describing the procedures in the field study. Special attention is paid to the standardization of methods, the training of research assistants and continuos quality control. Corrective measures are applied when necessary.

In addition to changes in morbidity, mortality and risk factors, data are also collected on the use of health services by the population. This is done partly by the above described mailed and field surveys, partly by collection of other available data.

Blood pressure treatment services are an important part of CVD treatment. Development of these services in an effective form was begun in 1972-1977 in the province of North Karelia in connection with the North Karelia project. A cumulative blood pressure register is being continued in the North Karelia monitoring area. This entails data collection on all persons within the health care system with blood pressure above set limits or having antihypertensive treatment. The register includes annual follow-up of the registered subjects concerning especially their blood pressure and treatment status.

3.3. Development and validation of a regional CVD morbidity and mortality monitoring system based on hospital discharge reports and death certificate data

In Finland, central hospitals are changing over in stages to a practice whereby they process to discharge reports of the other hospitals and health centres within their central hospital district. This is the case at the Kuopio University Central Hospital, and the Central Hospital of North Karelia is adopting the same practice during this year. The Kuopio University Central Hospital has also arranged a link with the mortality register so that medical data in the death certificate is sent to the data processing department of the hospital. This will provide a mortality register on the population from which the main cause of death and other diagnoses can be obtained.

The said arrangement offers a possibility of developing a regional follow-up system for CVD morbidity and mortality. This requires that common CVD diagnostic criteria and a common practice in the use of disease code numbers are agreed upon. A co-ordination of diagnosis of this kind is now being planned in the Kuopio University Central Hospital district. It will be used for MIs in connection with a regional MI treatment programme. The adoption of uniform criteria is also being planned in North Karelia for discharge report and death certificate data.

Maintaining separate MI and stroke registers as permanent and continuous operations entails many problems. It is not easy either to start registers of this kind of new areas. The use of the discharge report system and the use of death certificate data as a follow-up method of morbidity and mortality study offers in principle a possibility to create a permanent follow-up system for health care planning. This requires a sufficient degree of flexibility in the processing of data. The creation of such a system requires a test project. There seem to be possibilities for this in the Kuopio University Central Hospital district and the North Karelia Hospital district. Extending the experiment to North Karelia, where there is a separate MI register operating according to the diagnostic criteria of the WHO, would provide information on the extent of the difference between conventional diagnostic practice and that adopted from the WHO register.

4. DATA PROCESSING AND REPORTING

Data from the disease registers are continously sent to the data processing centre of the project. After necessary coding and data entry, regular feed-back is given to the local register centres in form of e.g. annual statistics.

Data from the risk factor surveys are also coded and entered for data processing at the project centre. Risk factor prevalence rates are analyzed separately for each survey. Persons with pathological laboratory values at the surveys receive their personal findings as a computer print-out, together with a letter of explanation.

The final results of the project are analyzed at the end of the ten-year period of the project. The analyses will concern both 1) the differences between the situation (incidence rate, prevalence rate) at the outset and the situation at the end of the period and 2) the regression coefficients of the trend (in case of several time points of observation) to test the given hypotheses of the study.

The results of the project will be published as separate reports (statistical results etc.) and as articles in scientific journals. In addition the Finnish data will be part of the international reports of the project, co-ordinated by WHO.

5. PROJECT ORGANIZATION AND TIME-TABLE

5.1. Organization

The character of the project (a large-scale project carried out in several research units, hospitals and health centres during a period of over 10 years) requires specific organizational and financial arrangements. The project requires the cooperation of both central and local administration levels. A project organization is also required to co-ordinate the different parts of the project and to ensure that methods of the cross-sectional and longitudinal studies remain standard during the whole study period.

The laboratory studies used in the measurement of risk factors are carried out during the entire project period in the same central laboratory (the Department of Biochemistry of the National Public Health Institute). The laboratory maintains measurement standards with the aid of internal quality control and outside reference laboratories.

The project data processing is carried out or coordinated by the National Public Health Institute. This ensures register co-ordination and uniform criteria. The collection and processing of hospital discharge reports and death certificate data is arranged in co-operation with the central laboratories and county administrations.

Risk factor measurements every five years require the hiring and training of separate field study groups each time. The measurements are carried out at the same time of year during a relatively short period. To maintain measurement standards personnel rotate through all three study areas.

The responsible institute for the project is the National Public Health Institute (Department of Epidemiology). The project has an advisory group, a director and a steering committee. The advisory group includes representatives of the National Board of Health, and its CVD expert group and of the National Public Health Institute and other members if necessary. The steering committee is formed of the persons actually in charge of the project. The project implementation entails a division into subprojects,

each with its own project group. These subdivisions are for the MI and stroke registers, for the monitoring of the risk factors and related factors, and the development of discharge reports and death data monitoring.

Each register area is independently responsible for the local operation of the register and its data collection. Each centre is free to publish its own results. Reports with collective results are dealt with in the project meetings.

5.2. Time-table

The planning of the project was begun in the beginning of 1980. During 1980 the draft protocol was prepared and previous data from disease registers in North Karelia were used for planning the operation of the disease registers. The commencement of stroke registering in Turku and MI and stroke registers in Loimaa was also planned.

The registering of MI and stroke cases was started in the beginning of 1981 in Loimaa as was the registering of stroke cases in Turku. The registering of MIs continued in Turku as well as the registering of MI and stroke cases in the area of the North Karelia Central Hospital following criteria as uniform as possible. The methods and the co-ordination were developed during this preparatory stage. From the beginning of 1982 the methods and criteria in accordance with the WHO protocol were adopted. This will be continued without change throughout the whole project period.

In the spring of 1981 preparations were begun for the 1982 risk factor field population survey. In the final plan of the survey the protocol adopted by the WHO meeting in October 1981 was taken into account. The yearly postal questionnaire surveys were started in the spring of 1981 in the monitoring areas. During 1982 the first joint data are processed and analyzed on the incidence of MI and stroke. These will be followed continuously from that time.

A postal survey on health behaviour, the use of health services and the socio-economic factors of the population will be carried out yearly in the spring and the risk factor field surveys will be carried out in 1982, 1987 and 1992.

6. PROJECT RESOURCES

The study costs are formed by annual project costs and the costs of the risk factor field surveys every five years. The National Public Health Institute personnel will carry out the project as part of their official work. Outside research workers from other institutions will also be working in the project.

Part of the project costs will be carried out directly by the participating institutions. Such operations are:

1. Data collection and diagnostic classification of disease registers carried out as part of the health care system operations in Turku, Loimaa and North Karelia.
2. Yearly postal surveys on the health behaviour of the adult population, which are carried out by the Department of Epidemiology of the National Public Health Institute.
3. Laboratory studies relating to risk factor measurements, carried out in the Department of Biochemistry of the National Public Health Institute.
4. Examination premises and possible assistance at different health centres for risk factor field surveys, arranged by local health authorities.

Additional resources are required at least at the initial stage for continuous data processing of disease registers, the risk factor field surveys and the processing, analysis and reporting of the material. If other needs (especially in 1982) can be linked to the study risk factor field survey (especially the assessment of the long-term effects of the North Karelia project) and funding can be obtained from the Academy of Finland for this purpose, the need for extra funding will diminish respectively. With National Public Health Institute's own research and investigation funds increasing in the coming years according to plan, the further field studies may be carried out completely with National Public Health Institute funds.

MONICA PROJECT, FINLAND

II SURVEY MANUAL

National Public Health Institute
Department of Epidemiology
Helsinki, 1981

CONTENTS

1. AIMS

The main aim of the survey carried out in 1982 in East and South West Finland is to obtain information for the following purposes:
a) monitoring of the CVD risk factors (baseline survey of the MONICA project)
b) evaluation of the community-based preventive programme carried out in North Karelia (10 year follow-up of the North Karelia project) and evaluation of associated studies in North Karelia.

This survey is called the HEART DISEASE RISK FACTOR STUDY 1982 of the WHO and the National Public Health Institute. The survey will be repeated in 1987 and 1992.

2. GENERAL SURVEY DESIGN

The city of Turku and rural municipalities of the Loimaa regional hospital area were chosen according to the general project protocol as target area in South West Finland. In East Finland the counties of North Karelia and Kuopio were chosen. In these two counties the survey is carried out in all municipalities.

The survey concerns the adult population of these monitoring areas. A sample of 4000 persons 25-64 years of age was chosen from each of the three areas by random sampling, stratified by age and sex, from the national population register. The total sample of all three areas is thus 12 000 persons. In addition, in 1982 there are extra samples of appr. 200 persons aged 15 to 24 from North Karelia and Kuopio counties. The total number of persons invited to participate in the survey is thus 12 400.

Persons who have permanently moved out of the survey area and deceased persons, who thus are not any more living in the area at the time of the survey, are not included in the basic population of the respective survey (even if they may fall into the sample due to recent migration

or death). On the other hand persons who have moved within the area are to be examined and as their municipality is registered that indicated by the sampling list. Persons who have recently moved from one study area to another and thus not any more living in the area that they were sampled for are not included in the basic population of the survey. Thus the sampling is based on a cross-section of the population actually living in the area at the time of the survey.

3. SURVEY SITES

The survey field activity is mainly carried out in the health centres of each municipality or on other sites as designated by the health board of the municipality. In Kuopio the screening centre of the university is used as survey site and in Turku the facilities will be rented in the centre of the city. In municipalities with two settled centres located far from each other the survey will be arranged in both centres. Health boards are requested to reserve for survey purposes one spacious waiting and reception room and three other examination rooms.

4. SURVEY PERSONNEL

The department of epidemiology of the National Public Health Institute in Helsinki is responsible for the planning and implementation of the survey.

One public health nurse, four nurses, four laboratory nurses and four auxiliary nurses are hired for the field study. These are formed into four study groups, each comprising of one nurse, one laboratory nurse and one auxiliary nurse. In 1982 an extra laboratory nurse carries out a special additional study on C and E-vitamins related to the survey.

The public health nurse acts as co-ordinator of the field work and when necessary, as reserve person to the groups.

The nurse acts as leader of her survey group and as a liaison with the survey centres. This person gives subjects belonging to subsamples

instructions on urine sample or food diary and checks as the questionnaires. This person also acts as reserve person to the laboratory nurse for taking blood samples.

The laboratory nurse takes the venous blood samples and takes care of their handling and mailing. She is also responsible for the handling and mailing of the urine samples. She also acts as person in reserve to the person measuring blood pressures.

The auxiliary nurse measures blood pressures and pulses and carries out an additional interview on fat used on bread.

The provision of one assistant will be requested from each health centre, usually a trained health centre assistant. The tasks of this person are preliminary preparations in the survey site and the reception of subjects invited to the survey, measurement of height and weight and local inquiries on the non-participants of the survey.

5. TIME-SCHEDULE

The survey personnel are trained in Helsinki at the National Public Health Institute during the period 4.1.-15.1.1982. A separate training programme is available.

Field work commences on the 18th of January 1982 and ends on the 2nd of April 1982. Each of the four study groups operates in the different survey areas (Kuopio county, North Karelia county and the Turku-Loimaa region) for an equal amount of time. The time-table of the groups are given in a separate schedule.

The study begins daily at 11 a.m. and ends between 7 and 8 p.m. Persons to be studied have been invited from 11 a.m. to 3.30 p.m. at a rate of 3 per 15 minutes and from 4 p.m. to 6.45 p.m. at a rate of 1 per 15 minutes. (It is expected that some people will change their appointments from before 4 o'clock to an evening hour, because of work commitments.)

About 60 to 70 persons per study group are invited each day. The study is carried out only on working days.

6. ARRANGEMENTS OF THE SURVEY PREMISES

Provision for the necessary chairs, tables and weight scales is made beforehand in the survey premises. The following is sent by mail to the liaisons in the various sites from the survey centre:

- blood sample tubes and needles
- serum tubes and stoppers
- throw-away pipettes
- mailing tubes for urine samples
- mailing boxes for samples
- packing materials (packing paper, mailing stickers)
- food diaries, model forms and filling instructions
- gathering instructions for urine collection
- stickers for serum and urine sample tubes
- urine collecting receptacles and stickers
- skin cleaning instructions

The material is mailed 10 days before the beginning of the survey to the location in question.

In addition to the above material each survey group also has the following equipment:

- height measuring stick
- 2 blood pressure measurement instruments
- stethoscope
- tourniquet
- population register stickers
- tube stands
- centrifuge
- packing material (tape, string, etc.)
- questionnaire forms

7. IMPLEMENTATION OF THE FIELD WORK

7.1. Invitations

Subjects of the sample are sent the questionnaire by mail as well as an invitation to the examination. The letter is mailed 10 days before the examination day. The invitation gives the purpose of the study and the location, date and time of the examination for the person invited.

The invitations and questionnaires are sent from the National Public Health Institute in Helsinki. The survey groups receive lists with the names of the persons invited. The names are listed by municipality in alphabetical order. The subjects are invited to the examination in alphabetical order. 67 persons are invited daily to be studied in the cities of Joensuu, Kuopio and Turku and 60 persons in the other municipalities, if local arrangements do not require otherwise. From 11 a.m. to 12.30 p.m. and 1.30 p.m. to 3.30 p.m. three persons per 15 minutes and from 4 p.m. to 6.45 p.m. one person per 15 minutes are invited. In addition to this, in Joensuu, Kuopio and Turku every hour one extra person is called.

The persons to be examined may change the time alloted to them by contacting a telephone number (of the National Public Health Institute) given in the invitation letter. A new time is primarily given for the same day as the original. If this is not possible, a new time is given in Joensuu, Kuopio and Turku usually in the last study week and in other localities for the last day of the study period. If necessary a new time can be given also: 1) at the same locality for another day, 2) at another locality in the same region, 3) at another locality in another region.

The survey groups contact the survey centre on the morning of each study day. The centre gives the names of persons invited to the survey that day (first and last names of list as well as changes) are given in alphabetical order.

In Joensuu, Kuopio and Turku persons absent from the survey are sent a new invitation and questionnaire which asks them to participate. The survey groups send the samples lists from these localities to the survey centre, from where new invitations are sent. The new examination times are given for the last week of study period. At other localities the local assistant together with the other survey team checks the list of invited persons at the end of each day and invites by telephone the persons who didn't show up. The new time is usually alloted for the last day of the survey period in that municipality. If there is no success in having the person participate, an attempt will be made to document the reason. This is marked on the sample list. If there is only one survey day at the locality, there can be no reinvitation. The same applies to the last survey day at all localities.

7.2. Activities of the survey situation

The survey participant fills out the questionnaire form at home and brings this with him or her to the survey site. In the survey study situation the following activities take place in the following order:

1. The local assistant
- receives the participant
- marks their arrival on the sample list
- looks through the questionnaire
- marks down those belonging to the subsamples
- gives the health knowledge questionnaire form to be filled out for those belonging to the respective subsample
- measures the height and weight of the person
- marks the time of arrival in the form
- carries out reinvitations by telephone } later
- mails serum and urine samples }

2. The auxiliary nurse
- carries out the interview on the amount and quality of bread fat
- takes the blood pressures
- takes the pulse

3. The laboratory nurse
- takes the venous blood samples
- carries out centrifuging and serum separation into mailing tubes
- is responsible for the handling of urine samples (later)

4. The nurse
- checks, and completes if necessary, the questionnaire form
- gives instructions to those in respective subsample for the collection of 24 h urine sample
- gives further instructions to those in the nutrition diary subsample
- checks that all measurements have been taken and samples obtained

The participant goes thus through the survey in the following order: local assistant - auxiliary nurse - laboratory nurse - nurse.

7.3. Reception of the participants and other activities of the local assistant

The local assistant receives the participant. The local assistant is given instructions beforehand on his/her duties and on the morning of each survey day at each locality the group nurse gives practical instructions on the tasks to be executed.

If no local assistant is available the survey centre will arrange for someone to carry out these tasks. If there are, however, two groups operating at the same time in the locality and a local assistant is not available, the public health nurse acts as assistant or one of the two laboratory nurses acts as assistant while the other laboratory nurse takes the venous blood samples and takes care of their handling for both groups.

The local assistant:
- receives the subject, checks his/her identity and address, and marks the person as arrived in the sample list
- writes the social security code number of the person on the form Those belonging to subsamples are marked with the appropriate colour
- measures height and weight

- looks through the questionnaire form and if necessary instructs on filling in missing parts
- gives the health knowledge questionnaire form to be filled out by those belonging to the subsample in question (yellow)
- at the end of the day checks on persons absent and attempts to contact them to come on the following days or takes down reason for being absent
- acts also in other capacities as liaison with the local health centre (eg. renewed blood pressure measurements, contacts with the laboratory, medical problems etc.)

In practice the following is carried out :

1. The participant is marked as arrived by writing the survey date next to the name in the right-hand margin of the sample list. At the same time address information is checked. A changed address is corrected but no changes are to be made with the social security code number or municipality code. There is a sticker on the back page of the questionnaire form with the name, identification code, language code, municipality code and address of the study person. The municipality marked in the sample list is regarded as the location of the person even if he/she has recently moved to another municipality (within the area).

2. The socal security code number (available from the list) is written carefully on the form under the sticker. After this the person's date of birth is checked and those belonging to subsamples are marked in the form (straight line) under the sticker on the back page of the form with a coloured felt pen using the following colours:
- yellow for subsample with collection of 24-hour urine sample and health knowledge test: all born between the first and the sixth day (incl.) of any month
- blue for the subsample that will keep nutrition diary: born between the 7th and the 12th day (incl.)
- green for blood pressure control measurements subsample: born on the 14th and 15th of any month.

The above concerns only people aged 25-64. All younger people (subjects of the extra samples in North Karelia and Kuopio counties) are also marked yellow (disregarding their day of birth).

3. Height and weight:
The survey group brings a height measuring stick with it. The subject stands without shoes with the back straight against the wall facing directly forwards (upper edge of ear cavity and outer corner of the eye on the same level). Height is marked to the nearest centimetre. Weight is measured with local counter-weight scales to the nearest 0,1 kg. Before use the scales are to be balanced. The subject must be dressed lightly (ie. no outer clothing, jackets, sweaters etc.).

4. Looking through the form:
The receiving person looks through the form. If there are unfilled parts, the person is asked to fill these in in the waiting room with assistance if necessary. If the subject says that he or she has lost the form (and has definitely been invited) he or she can be given a blank form and the information conrresponding to the missing sticker can be written on the back page (obtained from the sample list).

5. Health knowledge questionnaire:
Persons belonging to the "yellow" subsample are given a health knowledge questionnaire to be filled out in the waiting room. The identification code number (not the social security code number) is written in the right-hand upper corner of the form. Apart from technical assistance no other assistance is given in filling out this form. The filled out form is placed between the questionnaire pages.

6. At the end of the day the local assistant together with the study group checks on non-participants. As a high participation rate is of importance the local assistant attempts to contact absentees and ask them to come on the remining survey days. If the reason for not coming is known, it is written in the right-hand margin of the list, eg. "deceased", "moved to Sweden","mentally disabled", "refused", etc.

In unclear situations the local assistant contacts the survey group nurse who contacts survey centre in the National Public Health Institute, if necessary.

7.4. Blood pressure measurement and other activities of the auxiliary nurse

The following is carried out at the blood pressure measuring point by the auxiliary nurse:

- the participant arrives and sits down
- the cuff is placed on the right arm
- the participant is questioned on the amount and quality of bread fat
- the date and time is marked on the form
- the first blood pressure measurement is carried out
- the result is marked on the back page of the questionnaire form and on the day record list
- the pulse is taken
- the second blood pressure measurement is taken
- the results are marked as with the first measurement
- a third and fourth measurement is carried out for persons belonging to the "green" subsample (born on the 14th and 15th)

1. Bread fat inquiry:

The model pieces of bread are prepared in the morning before the survey commences. Dark bread and crisp bread are used as models. The dark bread is cut in two on slices of normal width from the middle part of the loaf so that they weigh about 30 g. Small end parts cannot be used. Crisp bread comes in ready cut 15 g pieces.

Ready-packed 10 g butter portions are divided into suitable parts and different amounts of butter are spread on four pieces of dark and crisp bread: 2.5 g, 5 g, 10 g and 15 g. The groups buy the bread and butter during the morning. The auxiliary nurse asks the subject freely the following questions:

1. How many pieces of bread (different kinds) do you eat a day on the average?
2. What kind of bread fat do you use?
3. Which of these samples corresponds closest to the amount you use?

The answers are written in the appropriate part on the back page of the form.

2. Blood pressure

Blood pressure is measured with a mercury manometer. Measurement is always carried out in a sitting position. The examinee sits at the table after which the cuff is placed on his right arm. The size of the cuff is 13 x 40 cm.

It wound tightly around the arm without, however, exerting too much pressure. On the side of the armpit the forefinger must fit between the cuff and the arm. The tubes from the cuff are placed on the side of the armpit so that the central part of the air cushion in the cuff exerts pressure on the brachial artery. The lower part of the cuff should be 2-3 cm from the elbow wo that space remains for the stethoscope. After the cuff is placed, the participant sits in a chair and is interviewed on bread fat quality and amount, as stated above.

The survey date and hour of measurement is marked on the back page of the form. The hour is given as the time, eg. 4.45 p.m. = 4 p.m.

Before the actual blood pressure measurement, the brachial artery is palpated. Thus the place where the pulse of the artery is strongest can be found. Then the arm is relaxed and placed in supination on a rest. The slightest pronation can cause the biceps tendon to press against the artery and thus cause false measurements. When the cuff is inflated the radial artery is palpated with the finger-tips. The cuff is inflated rapidly to about 30 mmHg above the point where the pulse of the radial artery is obliterated. The bell side of the stethoscope is placed with light pressure on the antecubital fossa where the artery was previously palpated. Strong pressure with the stethoscope will cause extra pressure on the artery and give rise to extra and confusing sounds.

The pressure in the cuff is released steadily so that the mercury column sinks 2 to 3 mm per heartbeat. In no case must the emptying of the cuff be interrupted and or more air pumped in. The cuff has to be allowed to completely empty without interruption.

Systolic blood pressure is marked as the level where the first sounds identifiable as heartbeat can be heard. Diastolic blood pressure is marked as the point where pulse sounds cease (fifth phase). Participants with fifth phase diastolic blood pressure reading zero are re-measured and the fourth phase, or weakening of sounds, is used as the diastolic blood pressure. In these (rare) cases a marking of 0 is made on the back page of the questionnaire form in the respective place.

In measuring it is important that the arm is approximately at heart level (at the level of the fourth intercostal at an angle of 0 - 40^{o} to the body). The readings for systolic and diastolic blood pressure are taken by 2 mm (only even numbers). The meter must be at eye-level to the measuring person.

After taking blood pressure the readings are written immediately in the appropriate part provided on the back page of the questionnaire form. They are also recorded on a separate form where all the blood pressure measurements of the day are recorded. This separate form with date and measurer code is sent daily to the survey centre for continuous quality control.

After the first measurement, the cuff valve is opened completely but the cuff is left on the arm. The pulse is then counted from the radial artery for a period of 30 seconds. The reading is marked in the appropriate space in the questionnaire back page. After this another pressure measurement is carried out in the same way as the first.

Persons born on the 14th and 15th days of any month are also subjected to third and a fourth measurement (see next). An extra measurement is also carried out by outside investigators in Kuopio with an automatic meter and a random zero manometer (for further quality control).

The blood pressure readings are also told to the participant. If the diastolic pressure is higher than 95 mmHg for a person under 40, and 100 mmHg or higher for a person of 40 or older the reading is regarded as being elevated. The subject is asked whether he/she has blood pressure follow-up or treatment. If this is the case, the person is urged to continue. In other cases the person is urged to have another measurement at the hypertension out-patient clinic or by public health nurse of the local health centre. If the diastolic blood pressure is 120 mmHg or higher the person is urged to make an immediate appointment with a doctor. The local assistant helps with these arrangements.

3. Blood pressure control measurements

Persons born on the 14th and 15th of any month are subjected to a third and a fourth blood pressure measurement. One of these is done with a short cuff (13 x 24 cm) the other using a conventional long cuff (13 x 40 cm). Each survey group has two blood pressure manometers, with a short cuff on one.

Participants of this "green" subsample are measured blood pressure twice as stated above. After this participants born on the 14th are measured blood pressure with the same methods using first a short cuff and then a long cuff. The measurements for persons born on the 15th are made in reverse order ie. first with the long cuff and then with the short cuff.
The results of the third and fourth measurements are marked on the back page of the form.

In Kuopio blood pressure is measured with an automatic blood pressure meter and a random zero meter in addition to the above measurements. The measurements are conducted after the actual survey and their arrangements and conduct will be the subject of special arrangements.

7.5. Venous blood sample

Two 10 ml sampletubes of blood are taken by the laboratory nurse from the antecubital vein with the participant in a sitting position. The antecubital fossa is uncovered and torniquet is placed around the arm. The skin is cleaned with isopropyl alcohol prep. The tourniquet is opened immediately after the needle has entered the vein.

The sample tube is marked immediately with a sticker (name, identification number) obtained from the population register. The tubes are kept standing at room temperature for half an hour and then placed in a refrigerator.

The tubes are centrifuged in several batches during the day. A centrifuging speed of 3000 rpm is used for 10-15 minutes. The centrifuged serum is seprated into transport tubes by pouring or by pipette. One to 1,5 ml is seprated into smaller transport tube and the rest of both tubes into the larger transport tube. The transport tubes are marked by writing on the sticker the observation code (eg. 01234), name of the participant and study date (eg. 01.02.82). The main serum sample is sent to the National Public Health Institute in Helsinki for cholesterol, HDL-cholesterol, thiocyanate and g-GT determination. The other is sent to the University of Tampere where the linoleic acid content of the cholesterol ester fraction is determined. All persons with a serum cholesterol $\geq$ 7,5 mmol/l are later informed of this by mail.

The serum tubes are packed in the examination place in specially designed styrox boxes with the smaller and larger tubes separated. The boxes with the larger tubes are sent to the National Public Health Institute and the boxes with the smaller tubes are sent to the University of Tampere, Department of Biomedicine. There are special mailing stickers for the packages. With each package is included a form with data on quality, number of sample tubes, place of mailing and sample date. The serum samples are thus sent fresh and analyzed in Helsinki immediately after arrival, as described later (within 2-5 days).

7.6 Questionnaire checking and control inquiry on smoking

The questionnaire is examined and any unanswered or unclear parts are filled in by the nurse. Special attention is paid to important questions (explained during training). The forms are mailed to the National Public Health Institute every week.

The nurse makes an additional informal interview to persons of the "green" subsample. The subject is asked whether he/she has ever smoked regularly ("regularly" is at least once a day for at least a year) and whether he/she has smoked during the last month. The results are then marked in the questionnaire space designated "control" with the average daily number of cigarettes smoked at present or before stopping if this took place within the previous month. Respectively, the number of cigars or pipefuls smoked daily is recorded, too. For these participants the enquiry is carried out before the nurse goes through the questionnaire and the written self-reports on smoking are not changed.

7.7. Collection of 24 h urine sample

Persons born on the 1st to 6th days of any calendar month as well as 14 to 24-year-olds in the Kuopio and North Karelia counties ("yellow" subsample) are asked to collect one day's urine and deliver it to the survey site or the local health centre on an assigned day.

The participants receive oral and written instructions by the survey nurse on how to collect the 24 h urine. The collecting is carried out usually on the next Sunday. In some cases the collecting can also be arranged on another Sunday during the study period if the reception, handling and transport of the urine can be arranged.

The subjects receive a collecting receptable with a sticker on the lid which is to be marked with name and collecting date, time of beginning and end of collecting, and the amount lost. Collecting is begun in the morning, when the time is marked on the sticker and is continued for a period of 24 hours.

The urine samples are received at the local health centre laboratory with the exception of Joensuu, Kuopio and Turku. The laboratory receives the sample, mixes and measures it and separates a 5 ml sample. The urine samples are marked in a list with the name of the study person, social security code number, identification number, collecting date and total amount of the urine. The amount is marked to the nearest 10 ml. The sample tube is left slightly less than filled. The tube is closed tight and a sticker is placed on it with the observation code of the study person, name and collecting date. The rest of the urine is disposed of and the receptable is rinsed out.

In the cities of Joensuu, Kuopio and Turku the study groups take care of the handling of the urine samples. The laboratory nurse of the group is in charge of the samples. The subjects return the urine samples next Monday beginning at 7.00 a.m. Empty cleaned receptables are sent to the National Public Health Institute in Helsinki. However, the receptacles used in Joensuu, Kuopio and Turku are not sent to Helsinki in the meanwhile but are kept at the survey locations. The necessary number of receptacles is sent from the survey centre to the localities in advance.

All who return the urine sample are informed by letter of their urine and blood analysis results.

7.8. Nutrition diary

Persons born on the 7th to 12th day of any month ("blue" subsample) are asked to keep a nutrition diary for three days. In the survey situation these persons receive oral and written instructions in keeping the diary as well as diary forms, model forms, filling instructions and a return envelope.

The keeping of the nutrition diary is begun on the morning following the study day. The co pleted diaries are sent in a given return envelope to the National Public Health Institute in Helsinki.

8. THE QUESTIONNAIRE

The main questionnaire consists of 123 precoded questions. Bulk of the questions have been previously tested and used in the North Karelia project. Recommendations of the international WHO coordinated MONICA project are also followed, as well as some other internationally commonly used principles. The questionnaire is printed. Subjects whose native language is Swedish (a small minority) receive the Swedish version of the questionnaire.

The subjects receive the questionnaire by mail and fill it out at home. This is done by circling the appropriate answer or by providing the inquired information by writing it on a given line. The subjects bring this questionnaire then with them to the examination place were it is checked by the trained survey nurse. The back page of the questionnaire is to be filled by the survey team at the examination place. Subjects belonging to a subsample ("yellow") complete a separate health knowledge questionnaire at the examination place. Subjects of another subsample ("blue") keep after the examination a nutrition diary for three days and mail it to the survey centre.

The questions of the questionnaire (and the measurements) can be grouped into following groups of variables:

(numbers refer to the questionnaire questions)

Physical measurements

- Weight, height
- S-cholesterol, HDL-cholesterol
- Serum thiocyanate, serum γ-GT
- Blood pressure (twice), pulse rate
- 24 h urinary sodium and potassium (subsample)

Smoking

- Smoking status (61, 62, 63, 64)
- Smoking habits (65, 66)
- Change process (67, 68, 69, 70)
- Advice to stop (71, 72)

Dietary habits

- Fat: with cooking (74, 75)
  with milk (79, 80, backpage 4, 5, 6)
  with bread
  with coffee or tea (78)
  with fatty meat (81)
- Sugar: with coffee or tea (76, 77)
  with drinks, deserts (85, 86)
- Eggs (82)
- Salt: salting habits (88, 89)
  salt taste level (90, 91, 92)
  salty food stuffs (95)
  advice to reduce (93, 94)
- Alcohol (87)
- Vegetables, berries (83, 84)
- Background (73)
- Change process (96)

Composition of the diet

- 3 day nutrition diary (subsample)

Weight

(- Weight, height)
- Change (97)
- Attempts of change (98)

Physical activity

- At work or on the way to work (50, 52)
- At leisure-time (51, 53, 54, 55, 56)

Blood pressure control

- Measurements (25, 26)
- Awareness (27, 28)
- Treatment (29, 30, 31)

Health service coverage

- Visit to doctor or public health nurse (12, 13)
- Participation to health examination (22)
- Participated in health education meeting (99), see also (71, 72, 93, 94)
- Cholesterol control (23, 24)
- Hypertension control (25-30))

Health knowledge, health attitudes, etc.

- Attitudes towards medical knowledge and prevention (112, 114, 116, 118)
- Opinion on importance of risk factors, personal risk (100)
- Perception of personal risk (101)
- Health knowledge (separate questionnaire, subsample)
    - total (1-24 or 1-36)
    - cardiovascular diseases (1, 3, 4, 13, 17, 24)
    - smoking (8, 12, 14, 16, 19, 23)
    - diet etc. (2, 6, 9, 10, 20, 21)
    - physical activity (5, 7, 11, 15, 18, 22)
    - salt (25-36)

Familiarity

- Familiarity: father (32)
  mother (33)

Stress

- General feeling of stress (41)
- General alienation (113, 115, 117)
- Satisfaction towards family life (102, 104, 106, 110)
- Satisfaction towards work (103, 105, 107)
- Satisfaction towards economic situation (108, 109, 111)
- Self-demands, aggressiviness, time urgency (120, 122, 123)
- Conceiling of feelings (119, 121)
- Use of relaxation techniques (60)

Social interaction

- Physical mobility (107, 108)
- Social contacts (109, 110, 111)
- Active participation to organizations (112, 113)
- Reading of newspapers (114)

Demography, socioeconomic situation

- General demography (1, 2, age, language)
- Residence (5, municipality)
- Household (6, 7)
- Education (3, 4)
- Economy (11)
- Occupation and employment (8, 9, 10)

Health status

- Subjective health (34)
- Known diseases: AMI, stroke, diabetes, other (15, 16, 17, 18)
- Symptoms:
    - cough (35, 36, 37)
    - chest pain, suggestive of angina pectoris (42-48) and of MI (49)
    - other somatic symptoms (38)
    - psychosomatic symptoms (39)
- Physical capacity, activities of daily living (40)
- Medication: self medication and other (21)
- General morbidity:
    - days of illness (19, 20)
    - disability pension (14)

The questionnaire is attached to this manual as an appendix.

9. LABORATORY ANALYSES

The following analyses and methods are used in connection with the survey in 1982. The aim is, however, to repeat the procedures as unchanged as possible with the subsequent surveys in 1987 and 1992.

Total and HDL-cholesterol are analyzed using an enzymatic reagent (Monotest, new, Boehringer Mannheim) and Olli C 3000 photometer (Kone Oy, Finland), the HDL-cholesterol after precipitation of VLDL and LDL with dextran-$MgCl_2$ [1]. In the begin of each working day a so called "calibration block" is analyzed. It consists of seven aqueous cholesterol standards (Preciset, Boehringer Mannheim) and all the different controls used in the study, all in duplicates. The absorbances of the standards are noted and, when within acceptable limits as to the linearity and to the day-to-day variation, the samples of the day are measured with these standards. - In each working block of 24 samples there are two standards and two of the five different

1) Kostner, G.M. Clin.Chem. 1976, 20:1344-1348.

control serums, changing from block to block. Three of the control serums are commercial lyophilized serums: Biotrol (Biotrol, France) Precilip EL and Precilip (Boehringer Mannheim) and two frozen human pools of our own. These serums cover the range from 2,80 to 6,60 mmol/l for total cholesterol and from 0,50 to 2,20 mmol/l for HDL-cholesterol, approximately. In addition, ten per cent of the samples are reanalyzed on the following day in order to ensure that there is no constant shift.

Thiocyanate is analyzed according to Butts & al.[1] with AutonAnalyzer II (Technicon) by using weighed aqueous standards. Two different control serums are used: one lyophilized commercial control (Seroquant, Behringwerke) and a frozen human pool of our own. On each plate of 40 samples, the calibration standards are run. Each run of 40 samples is calibrated with five standards and controlled with four control samples.

Serum gamma-GT is analyzed with LKB 8600 kinetic analyzer according to the recommendation of the Scandinavian Committee on Enzymes[2] using the reagents from Baker Chemicals B.V.

10. ADMINISTRATIVE ASPECTS

The study is carried out by the National Public Health Institute. The institute is subordinated to the National Board of Health, which has also approved of the project and partly funds the survey. The health boards of the municipalities receive from the National Public Health Institute and the National Board of Health a letter which asks them to approve of the plan of implementation of the survey in their areas.

The extra survey personnel for the survey groups are hired by the National Public Health Institute for the period from January 4th to April 3rd, 1982. The nurses receive monthly wage with no raises or additions to this salary.

1) Butts, W., Kuehneman, M. and Graham M. Widowson. Clin.Chem. 1974, 20: 1344-1348
2) Scandinavian Committee on Enzymes. Scand.J.Clin.Lab.Invest. 1976:36: 119-125

During the screening days the survey nurses are paid a daily allowance in accordance with government regulations. For accommodation expenses the hotels mainly send a direct invoice.

All monetary matters and other arrangements connected with the study are subject to government regulations. For daily allowances and accommodation expenses normal government travel orders and invoices are completed (hotels can, however, be asked to invoice directly). When rented cars are used, the rental firm invoices the National Public Health Institute directly. Urgently required material and equipment can be purchased by invoice to the National Public Health Institute. Telephone calls from the field to the National Public Health Institute can made collect or the bill can be sent to the Institute.

Within the National Public Health Institute the department of epidemiology is responsible for the whole MONICA project and as well as for the 1982 field survey linked to it. The director of the department (professor Pekka Puska) is to be contacted for all questions relating to the general aims of the survey or the general administrative questions involved. A research investigator is responsible for the practical supervision of the field work. A research assistant is responsible for mailing the letters of invitation and questions relating to survey times.

QUESTIONNAIRE (sent with the letter of invitation)

1. Sex
   1 male
   2 female

2. Are you
   1 married, or common-law married
   2 single
   3 separated or divorced
   4 widowed

3. What is your education?
   1 primary, basic or secondary school
   2 vocational school
   3 high school
   4 college or university

4. How many years have you altogether gone to school or studied full-time in your life?
   _____ years

5. What was your residence on 1.1.1972?
   1 present community
   2 present community in the present county
   3 other county

6. Does your household consist, in addition to yourself, of other persons aged 16 or more (husband, wife, children, pensioned, etc.)?
   1 no
   2 yes, how many? _____

7. Do you have children below the age of 16?
   1 no
   2 yes, how many? _____

8. What is your occupation?
   _____

9. What kind of work do you do for most of the year?
   1 agriculture, farming, forestry
   2 industrial, mining construction or other similar work
   3 office work, intellectual work, service
   4 studying
   5 housewife
   6 pensioned
   7 unemployed

10. What kind of work have you done for the longest period of your life?
    1 agriculture, farming, forestry
    2 industrial, mining construction or other similar work
    3 office work, intellectual work, service
    4 studying
    5 housewife
    6 pensioned
    7 unemployed

11. How big was the total income of your household last year, not excluding the taxes?
    1 less than 10.000 mk
    2 10.000 - 20.000
    3 20.001 - 40.000
    4 40.001 - 60.000
    5 60.001 - 80.000
    6 80.001 - 100.000
    7 100.001 - 140.000
    8 more than 140.000 mk

MEDICAL EXAMINATIONS AND DISEASES

12. How often did you, during the last year see a doctor? (A dentist is not included)
    _____ times

13. How often did you, during the last year, go to see a public health nurse or blood pressure nurse or an occupational health nurse or a public health nurse has visited you?
    _____ times

14. Are you pensioned because of disability?
    1 no
    2 yes, partial pension
    3 yes, for a given period
    4 yes, continuously

15. Have you had an myocardial infarction or heart attack confirmed by a doctor? (Check the date in your polyclinic card if you are not sure)

1 no
2 yes When was the last time:
year 19____
Where were you in hospital?

_____

_____

Were you in a rehabilitation group after discharge from hospital?
1 no
2 yes

16. Have you had a stroke, brain hemorrhage or brain infarction confirmed by a doctor? (Check the date at your polyclinic card, if you are not sure)

1 no
2 yes, when was the last time:
year 19____

17. Have you during the last year had any of the following diseases confirmed or treated by a doctor?

	no.	yes
Elevated blood pressure, hypertension	1	2
Heart failure	1	2
Angina pectoris	1	2
Asthma	1	2
Emphysema, chronic bronchitis	1	2
Gallstones, biliary disease	1	2
Rheumatic arthritis	1	2
Other disease of joints	1	2
Disease of the back	1	2
Chronic dermatitis	1	2
Chronic pyelonephritis	1	2

18. Do you have diabetes confirmed by a doctor?

1 no
2 yes, I take insulin injections
3 yes, I take oral hypoglycemies
4 yes, only dietary care

19. How many days, during the last year, were you absent from work or did not do your normal work because of illness? (If you do not remember exactly, give an estimation).

_____ days

20. How many days, during the last year, were you hospitalized?

_____ days

21. Have you during the last week (7 days) used any

a) medicine prescribed by a doctor
1 no
2 yes

b) medicine without prescription
1 no
2 yes

If you have used some medicine during the last week, mention for what symptom or disease did you use them.

	With pre-scription	Without pre-scription
Headache	1	2
Joint or back-ache	1	2
Other ache	1	2
Common cold, cough or fever	1	2
Restlessness	1	2
Sleeplessness	1	2
Gastric trouble or constipation	1	2
Vitamins, strengthening medicine	1	2
Medicine for high blood pressure	1	2
Heart medicine	1	2
Contraceptive pill	1	2
Dermatological medicine	1	2
Other medicine	1	2

For what symptom:

_____

_____

22. When did you last have a health examination, i.e. a medical examination not due to symptoms or illness (e.g., for a job, for driving licence, for pregnancy, health examination of the mobile clinic)?

1 during the last half-year
2 ½ - 1 year ago
3 1 - 5 years ago
4 more than 5 years ago
7 never

23. Has your blood pressure ever been measured? When was the last time?
    1 during the last half-year
    2 ½ - 1 year ago
    3 1 - 5 years ago
    4 more than 5 years ago
    5 never
    6 I don't know

24. Have you ever been told that you have high or elevated blood cholesterol or fat level?
    1 no
    2 yes

25. Has your blood pressure ever been measured? When was the last time?
    1 during the last half-year
    2 ½ - 1 year ago
    3 1 - 5 years ago
    4 more than 5 years ago
    5 never

26. How many times was your blood pressure measured during the last year?
    _____ times

27. Have you ever been told that you have high or elevated blood pressure?
    1 no (move to question 32)
    2 yes

28. How old were you when elevated blood pressure was first discovered?
    _____ years

29. Have you ever used antihypertensive drugs?
    1 no (move to question 32)
    2 yes

30. When did you last take antihypertensive drugs?
    1 today or yesterday
    2 2 - 7 days ago
    3 1 week to 1 month ago
    4 1 month to ½ year ago
    5 ½ year to 1 year ago
    6 1 - 2 years ago
    7 2 - 5 years ago
    8 more than 5 years ago

31. If you don't use antihypertensive drugs what is the main reason why? (Choose the most important)
    1 the doctor told me to stop
    2 the public health nurse told me to stop
    3 the medicine gave me side-effects
    4 I don't like to use medicines
    5 the prescription wasn't refilled
    0 I do take antihypertensive drugs at the moment

32. Has your father had, below 60 years of age, any of the following diseases?
    a. myocardial infarction, angina pectoris
        1 no
        2 yes
    b. stroke
        1 no
        2 yes

33. Has your mother had, below 60 years of age, any of the following diseases?
    a. myocardial infarction, angina pectoris
        1 no
        2 yes
    b. stroke
        1 no
        2 yes

PRESENT HEALTH STATUS

34. What do you think of your present state of health? It is
    1 very good
    2 reasonably good
    3 medium
    4 not very good
    5 very bad

35. Do you usually cough first thing in the morning in the winter?
    1 no
    2 yes

36. Do you usually cough during the day or at night in the winter?
    1 no
    2 yes

37. Do you cough like this on most days for as much as three months each year?
1 no
2 yes

38. Have you, during the last month (30 days) had any of the following symptoms or troubles? (Think of all the symptoms.)

	No	Yes
Rheumatic trouble	1	2
Joint ache	1	2
Back-ache	1	2
Swelling in feet	1	2
Various veins	1	2
Constipation	1	2
Continuous gastric trouble	1	2
Nausea	1	2
Weak legs	1	2
Dry mouth	1	2
Stuffy nose	1	2

39. In the following we shall ask you some personal questions. Think of the last month. Mention how often the symptom has troubled.

	Often	Some-times	Never
Has your heart rate increased?	3	2	1
Does your mind get confused when you have to do some work quickly?	3	2	1
Do your hands tremble?	3	2	1
Do you feel excited and nervous?	3	2	1
Do frightening thoughts stay in your mind?	3	2	1
Do you feel very tired and overworked?	3	2	1
Do irregular heartbeats trouble you?	3	2	1
Do you have dizziness in your head?	3	2	1
Do you have nightmares?	3	2	1
Do you feel depressed?	3	2	1
Do you have sleeplessness?	3	2	1
Do you have headaches?	3	2	1
Do you have wet hands?	3	2	1

40. Can you do the following without trouble?

	Yes	No
Bathe self	1	2
Get dressed	1	2
Move up a flight of stairs without stopping	1	2
Walk a half a kilometer without resting	1	2
Running a short distance (about 100 meters)	1	2
Running a long distance (over half a kilometer)	1	2

41. Have you been tense, stressed or under high pressure in the last month?
1 yes - my life is nearly unbearable
2 yes - more than is usual for people
3 yes - somewhat but not usually so
4 not at all

42. Have you ever had pain in your chest?
1 no
2 yes (go to question 44)

43. Have you ever had pressure or heaviness in your chest?
1 no (go to question 50)
2 yes

44. Do you get chest pain when you walk up hill or hurry on the level? (Answer yes, if you get the pain when walking up hill or hurrying.)
1 no (go to question 49)
2 yes
3 I don't walk up hill or hurry

45. Do you get chest pain when you walk at your usual speed on the level?
1 no
2 yes

46. What do you do, if you get the chest pain when walking? (Answer 'stop or slow down', if you take "nitro" and continue.)
1 I stop or slow down
2 I keep walking (go to question 49)

47. If you stop, what happens to the chest pain?
1 it gets better
2 it doesn't get hetter (go to question 49)

48. How long does it take for the pain to go away?
1 10 minutes or less
2 more than 10 minutes

49. Have you ever had severe pain in the middle of the chest that has lasted ½ hour or more?
1 no
2 yes

PHYSICAL ACTIVITY

50. How much physical activity do you have at work? We have divided occupations into four groups. If you do not work, mention group 1. (Mention only one group.)
    1 My work is mainly sitting work. I do not walk much during my work. Examples: watchmaker, radio mechanic, industrial sewing work, office work at a table
    2 I walk in my work quite a lot but I do not have to lift or carry heavy things. Examples: shop assistant, light industrial work, office work where one has to move
    3 I have in my work to walk and carry a lot or often to climb staircases or go uphill. Examples: carpenter or farmhand, work in engine-shop, heavy industrial work
    4 My work is heavy physical work, where I have to carry or lift heavy things, to dig, to shovel or to cut much. Examples: forestry work, heavy farmwork, heavy construction and industrial work

51. How much physical activity do you have during leisure-time? If it varies with the seasons, mention the group that best represents the medium of the year. (Mention only one group.)
    1 In my leisure-time I read, watch television and do things which do not need physical activity
    2 In my leisure-time I walk, ride a bicycle or move in other ways requiring physical activity at least for four hours a week. In this is included walking, fishing and hunting, lighter garden work and so on; but not going to and coming from work
    3 In my leisure-time I have physical activities to maintain my condition such as running, skiing, gymnastics, swimming, baal-games or doing heavy garden work or similar for at least three hours a week
    4 I train in my leisure-time regularly for competitions several days a week, running, orienteering, baal-games or other physically heavy sports

52. How many minutes a day do you spend walking, bicycling or getting other physical activity on your way to work? (Include both the time spent going to and coming from work)
    1 I don't work or get physical activity on the way to work
    2 less than 15 minutes a day
    3 15 - 29 minutes a day
    4 30 - 44 minutes a day
    5 45 - 59 minutes a day
    6 greater than on hour a day

53. How often do you do physical activities lasting 20 - 30 minutes which make you short of breath and perspire?
    1 daily
    2 2 - 3 times a week
    3 once a week
    4 2 - 3 times a month
    5 a few times a year or less
    0 I cannot because of disease or disability (go to question 60)

54. How many times a week do you do such leisure-time physical activities so that they make you a little short of breath and to perspire?

    _____ times a week

55. How long do your physical activity episodes last?
    1 less than 15 minutes
    2 15 - 29 minutes
    3 30 - 59 minutes
    4 one hour or longer

56. How many kilometers do you run, jog or ski in the usual week?

    _____ km

57. How do you consider your present physical condition?
    1 very good
    2 reasonably good
    3 reasonable
    4 not very good
    5 very bad

58. Have you ever seriously tried to increase your leisure-time physical activity? If so, when last?
    1 never
    2 more than a half-year ago
    3 one month - a half-year ago
    4 during the last month

59. Has your leisure-time physical activity, during the last half-year, increased?
    1 very much
    2 a little
    3 the same
    4 decreased a little
    5 decreased very much

60. Do you relax by some method so that you spend at least ten minutes without doing anything?
    1 not at all
    2 yes, sometimes
    3 yes, regularly

SMOKING

61. Have you ever smoked in your life?
    1 no (proceed to question 73)
    2 yes

62. Have you ever smoked regularly (almost every day for at least one year)? How many years altogether?
    1 I have never smoked regularly
    2 I have smoked regularly altogether ___ years

63. Do you smoke tobacco (cigarettes, cigars, pipes)?
    1 yes, regularly
    2 occasionally
    3 not at all

64. When did you last smoke? If you smoke at present, put the alternative 1.
    1 yesterday or today
    2 2 days - 1 month ago
    3 1 month - half year ago (proceed to question 71)
    4 half year to a year ago (proceed to question 71)
    5 more than a year ago (proceed to question 71)

65. How much do you smoke or did you smoke before you stopped, on an average per day?

filter cigarettes	_____ cigarettes per day
non-filter cigarettes	_____ cigarettes per day
pipe	_____ pipes a day
cigars	_____ cigars a day

66. Do you, or did you, inhale?
    1 no
    2 yes

67. What do you think of your present smoking? Do you smoke:
    1 far too much
    2 a little too much
    3 moderately
    0 I don't smoke at present

68. Do you want to stop smoking?
    1 no
    2 yes
    3 I'm not sure
    0 I don't smoke now

69. If you would try to stop smoking, do you think you would be successful?
    1 no
    2 yes
    3 I'm not sure
    0 I don't smoke now

70. Have you ever tried seriously to stop smoking? If so, when last?
    1 never
    2 more than one year ago
    3 half year to one year ago
    4 a month to a half year ago
    5 during the last month

71. Has any doctor, during the last year, adviced you to stop smoking?
    1 never
    2 once
    3 several times

72. Has any public health nurse or occupational health nurse, during the last year, advised you to stop smoking?
    1 never
    2 once
    3 several times

NUTRITION

73. Where do you usually eat
    a) lunch (the meal between 10 a.m. and 3 p.m.)
        1 at home
        2 in a restaurant or a bar
        3 at the work site bar
        4 somewhere other than these sites above
        0 I don't eat a noon meal

    b) the evening meal (between 5 and 9 p.m.)
        1 at home
        2 in a restaurant or a bar
        3 at my place of work
        4 at my place other than mentioned above
        0 I don't eat an evening meal

74. What fat do you use at your home for cooking?
1 mostly oil
2 mostly soft margarine
3 mostly regular margarine
4 mostly mixed butter and oil
5 mostly butter
0 food is not made at my home

75. What fat is used in your home for baking?
1 mostly oil
2 mostly soft margarine
3 mostly regular margarine
4 mostly mixed butter and oil
5 mostly butter
0 baking is not done at my home

76. How many cups of coffee or tea do you usually have a day? If you don't have any, put a stroke.
coffee _____ cups
tea _____ cups

77. How many lumps of sugar or spoonfuls of fine sugar you use for one cup of coffee or tea?
_____ lumps or spoonfuls in a cup

78. Do you put milk or cream in your coffee?
1 no milk or cream
2 milk
3 cream
9 I don't drink coffee

79. How many glasses (one glass equivalent to 2 decilitres) do you usually have a day?
milk _____
sour milk_____

80. If you have milk do you usually use:
1 whole milk (ordinary cow's milk, fat percentage about 4.3 % or more)
2 consumption milk (ordinary shop milk, fat percentage about 3.4 %)
3 light milk (low-fat milk, fat percentage about 2.5 %)
4 skim milk (fat percentage about 0.05 %)
0 I don't drink milk

81. Do you eat the visible fat in your meals?
1 never
2 seldom
3 often
4 always
0 I don't eat pork

82. How many eggs (cooked or fried) do you usually eat per week?
_____ eggs per week

83. How often, during the last week, have you eaten vegetables or roots (do not include potatoes) as such or boiled?
1 never
2 on 1 - 2 days
3 on 3 - 5 days
4 on 6 - 7 days

84. How often, during the last week, have you eaten roots or berries?
1 not at all
2 on 1 - 2 days
3 on 3 - 5 days
4 on 6 - 7 days

85. Do you usually have sweet refreshing drinks?
1 never
2 once a week or more seldom
3 a few times a week
4 once a day or more often

86. How often do you eat sweets?
1 never
2 once a week or less
3 a few times a week
4 daily or more

87. How many glasses (restaurant portions) or bottles of the following have you drunk in the last week (seven days). (If you have not drunk at all answer 0.)
strong beer _____ bottles
free-mixed highballs _____ bottles
strong alcohol _____ restaurant portions (about 4 c
wine or equivalent _____ glasses

88. Do you add salt to your meals at the table?
1 never
2 when the food is not salty enough
3 almost always before testing

89. What kind of salt is usually used in your home?
1 iodized salt
2 sea salt
3 mineral salt

90. When you eat out, does the food usually taste, compared with the food at home
1 less salty than at home
2 as salty as at home
3 more salty than at home

91. Is in your opinion ready-made food compared to home made food
1 less salty than at home
2 as salty as at home
3 more salty than at home

92. What kind of butter or margarine do you use?
1 saltfree
2 normal salted
3 heavy salted butter

93. Have you ever been told to use less salt?
1 no
2 yes, because of high blood pressure
3 yes, for other reasons

94. Who is it that told you to use less salt?
1 a doctor
2 a public health-, hospital, or occupational nurse
3 a nutritionist
4 someone else

95. How often do you eat the following foods? Make a response for each food.

	once a day or more	nearly every day	a few times a week	once a week	once or a few times a month	rarely or never
a. salt fish	1	2	3	4	5	6
b. smoked fish	1	2	3	4	5	6
c. salted mushrooms	1	2	3	4	5	6
d. salted cucumbers	1	2	3	4	5	6
e. sausages	1	2	3	3	5	5
f. ketchup, mustard or other meat sauces	1	2	3	4	5	6

96. During the past year have you changed your diet for reasons of health?
1 decreased the amount of fat
2 changed the type of fat
3 increased the use of vegetables
4 decreased the amount of sugar
5 decreased the amount of salt

97. Has your weight changed in the past year?
1 increased about _____ kilograms
2 stayed the same
3 decreased about _____ kilograms

98. Have you ever seriously tried to lose weight? If so, when last?
1 never
2 more than a year ago
3 half a year to one year ago
4 one month to a half year ago
5 during the last month

OTHER QUESTIONS

99. How often, during the last year, have you participated in a meeting where an expert has spoken about smoking or healthy diet?
    1 never
    2 1 - 2 times
    3 3 - 4 times
    4 5 - 6 times
    5 7 - 10 times
    6 more than ten times

100. Indicate why the people of Finland have so much illness (Note: Indicate only one reason.)
    1 wrong diet
    2 stress
    3 lack of vitamins
    4 lack of minerals
    5 lack of basic nutrition
    6 overweight
    7 genetic aspects
    8 alcohol
    9 lack of health services
    0 pollution or poisoning of food or environment

101. It is said that some people have clearly greater risk of getting heart disease then others. How great do you think is your own risk in comparison with others of your age?
    1 much greater
    2 a little greater
    3 the same
    4 a little less
    5 much less

102. Do you think your marriage is
    1 very happy
    2 fairly happy
    3 difficult to say
    4 rather unhappy
    5 very unhappy
    0 I am not married

103. How often does it worry you that you have to try very hard in order to take care of your present amount of work?
    1 almost all the time
    2 very often
    3 at times
    4 seldom
    5 never

104. Do you have difficulties in getting along with your wife or husband?
    1 almost all the time
    2 very often
    3 at times
    4 seldom
    5 never

105. How often does it worry you that there is often such a hurry in your work?
    1 almost all the time
    2 very often
    3 at times
    4 seldom
    5 never

106. Have you had particular troubles with your children?
    1 almost all the time
    2 very often
    3 at times
    4 seldom
    5 never
    0 I don't have children

107. How often does it worry you that your work seems to disturb your family life?
    1 almost all the time
    2 very often
    3 at times
    4 seldom
    5 never
    6 I don't have family

108. How satisfied are you with your economic situation?
    1 very satisfied
    2 satisfied
    3 to some extent satisfied
    4 dissatisfied
    5 very dissatisfied

109. How satisfied are you with your achievements in life?
    1 very satisfied
    2 satisfied
    3 fairly satisfied
    4 dissatisfied
    5 very dissatisfied

110. How satisfied are you with your family life?
1 very satisfied
2 satisfied
3 fairly satisfied
4 dissatisfied
5 very dissatisfied

111. Is your economic situation now better or worse than previously?
1 much better
2 a little better
3 about the same
4 a little worse
5 much worse

In the following we give some statements on which people have different opinions. State your own opinion by indicating the alternative which best fits with your personal opinion.

112. Heart disease can be prevented by healthy living.
1 I completely agree
2 I agree to some extent
3 it is difficult to say
4 I disagree to some extent
5 I completely disagree

113. It seems to me impossible to achieve the goals in life that I would like to aim at.
1 I completely agree
2 I agree to some extent
3 difficult to say
4 I disagree to some extent
5 I completely disagree

114. It is always healthy to stop smoking.
1 I completely agree
2 I agree to some extent
3 it is difficult to say
4 I disagree to some extent
5 I completely disagree

115. The future seems to me hopeless and I cannot believe that things are going to become any better.
1 I completely agree
2 I agree to some extent
3 difficult to say
4 I disagree to some extent
5 I completely disagree

116. Change of diet in middle-age is not beneficial.
1 I completely agree
2 I agree to some extent
3 it is difficult to say
4 I disagree to some extent
5 I completely disagree

117. I feel that I don't have any proper friends.
1 I completely agree
2 I agree to some extent
3 difficult to say
4 I disagree to some extent
5 I completely disagree

118. It is not helpful to treat high blood pressure if there are no symptoms.
1 I completely agree
2 I agree to some extent
3 it is difficult to say
4 I disagree to some extent
5 I completely disagree

119. When really angry or annoyed I try to act as though nothing happened.
1 never
2 seldom
3 sometimes
4 often
5 almost always

120. I am very demanding and critical of myself and others.
1 never
2 seldom
3 sometimes
4 often
5 almost always

121. When really angry or annoyed I keep it to myself.
1 never
2 seldom
3 sometimes
4 often
5 almost always

122. I get frustrated easily.
1 never
2 seldom
3 sometimes
4 often
5 almost always

123. On a busy day I worry about getting everything done.
1 never
2 seldom
3 sometimes
4 often
5 almost always

PHYSICAL EXAMINATION (TO BE COMPLETED BY SURVEY PERSONNEL)

1. Length _____ cm
2. Weight _____ kg
3. Code of blood pressure measurer _____
4. Number of pieces of bread
   _____ pieces/day
5. Sort of fat usually used on bread
   1 mostly soft margarine
   2 mostly regular margarine
   3 mostly mixed butter and oil
   4 mostly butter
   5 no butter or margarine
6. Amount of fat usually put on a slice of bread (model pieces shown)
   1 2.5 g
   2 5 g
   3 10 g
   4 15 g
   0 0 g
7. Blood pressure:
   1) _____/_____ 2) _____/_____ mmHg
8. Pulse rate _____/30 s.
9. Control measurement of blood pressure (subsample)
   1) _____/_____ 2) _____/_____ mmHg
   Short cuff
   1 third measurement (born on 14th day of month)
   2 fourth measurement (born on 15th day of month)
10. Day of examination ____/____1982
    Hour of examination _____
11. Fasting _____ hours
12. Blood sample taken
    1 no
    2 yes
13. Instructions for urine collection (subsample)
    0 not in sample
    1 yes, instructions given
    2 no, refused to collect urine
14. Instructions for food diary (subsample)
    0 not in sample
    1 yes, instructions given
    2 no, refused to take food diary
15. Control inquiry on smoking (subsample)
    _____ (cigarettes smoked/day for past month)
    _____ (pipes & cigars smoked/day for past month)
16. Other:
    _____ (enter "0", if phase 5 of Korotkoff sounds = 0)
    _____ If pregnant, note here

preprinted sticker:

NAME			
municipality	area	language	identification number
ADDRESS			

social security number

HEALTH KNOWLEDGE QUESTIONNAIRE (to be completed at the examination place)

The next questions concern matters on health and diseases. Every question has only one right answer. So choose only one alternative.

1. A heart infarction means in practice that
   1 a blood clar goes through the heart
   2 one of arteries of the heart is blocked
   3 the rythm of the heart is disturbed
   4 I don't know

2. Cholesterol is
   1 hormone
   2 mineral
   3 fatty substance in blood
   4 I don't know

3. High blood pressure causes
   1 headache, dizziness and feelings of pressure in the head
   2 oedema of the feet
   3 very seldom any symptoms
   4 I don't know

4. Heart diseases among the middle-aged men have in the 1970's
   1 increased
   2 not changed
   3 decreased
   4 I don't know

5. To maintain good physical condition one should exercise
   1 1-2 times a month
   2 once a week
   3 2-3 times a week
   4 more than 3 times a week
   5 I don't know

6. The most usual cause of overweight is
   1 hormonal disturbance
   2 heredity
   3 excess food
   4 I don't know

7. If one has good physical condition, his/her heart rate at rest, compared to the person who is in a bad physical condition, is on an average
   1 slower
   2 the same
   3 quicker
   4 I don't know

8. Nicotine and carbon monoxide
   1 don't get absorbed from the lungs to blood at all
   2 get absorbed to blood only if you are a hard smoker
   3 get absorbed to blood from the lungs always if you smoke
   4 I don't know

9. Which is the next substances there is in excess in the national diet
   1 protein
   2 fat
   3 bread
   4 I don't know

10. Does sugar in diet affect fatty substances in blood?
   1 not at all
   2 yes, some fatty substances
   3 yes, all fatty substances
   4 I don't know

11. If one wants to get a good physical condition, one has in the exercise to
   1 perspire a lot and breath heavily
   2 perspire a little and breath a little more than normally
   3 perspiring and breathing heavier than normally is not necessary
   4 I don't know

12. Smoking
    1 increases the heart rate
    2 doesn't affect the heart rate at all
    3 decreases the heart rate
    4 I don't know

13. If your blood vessels start to obstruct, you can notice it
    1 after some weeks
    2 after some months
    3 after some years
    4 I don't know

14. If one inhales with a pipe as much as with a cigarette, smoking is
    1 more dangerous
    2 as dangerous
    3 not so dangerous
    4 I don't know

15. Short term feelings of pain in the chest are among young males in bad physical condition compared with males in good physical condition
    1 more common
    2 as common
    3 less common
    4 I don't know

16. For most people the most important reason for breathing polluted air is
    1 cars
    2 industry
    3 smoking
    4 I don't know

17. If a middle-aged man has in his chest intensive pain for more than half an hour, he should
    1 take drugs to relieve pain
    2 take it more easy in the future
    3 make an appointment with a doctor
    4 call a doctor or hospital immediately
    5 I don't know

18. Heart patients who have previously exercised, recover from illness compared with patients with worse physical condition
    1 better
    2 as well
    3 worse
    4 I don't know

19. Smokers have slight bronchitis compared with non-smokers
    1 more often
    2 as often
    3 less often
    4 I don't know

20. Does sugar contain vitamines?
    1 very much
    2 somewhat
    3 not at all
    4 I don't know

21. Full milk compared with skimmed milk is
    1 more healthy
    2 as healthy
    3 less healthy
    4 I don't know

22. The impact of exercise is most important for health for
    1 respiratory system.
    2 heart
    3 musculature
    4 I don't know

23. Smokers recover from their first heart attack compared with non-smokers
    1 better
    2 as well
    3 worse
    4 I don't know

24. Coronary artery means
    1 small vessels around other vessels
    2 the vessels of the heart muscle
    3 the vessels of the lungs
    4 I don't know

25. Table salt consists of
    1 sodium chloride
    2 potassium chloride
    3 magnesium chloride
    4 I don't know

26. It has been stated that salt tends to elevate blood pressure because of its
    1 sodium
    2 potassium
    3 magnesium
    4 I don't know

27. Finns use salt on an average daily per person
    1 less than 1 g
    2 3-5 g
    3 10-15 g
    4 I don't know

28. The recommended daily intake of salt per person is
    1 less than 1 g
    2 3-5 g
    3 10-15 g
    4 I don't know

29. Sodium, potassium and magnesium are
    1 hormones
    2 vitamines
    3 minerals
    4 I don't know

30. During pregnancy the mother should use salt
    1 more than usually
    2 less than usually
    3 it does not matter
    4 I don't know

31. During first year of life the child's food
    1 should have more salt
    2 should have less salt
    3 it does not matter
    4 I don't know

32. The so called mineral salt has, compared with regular salt
    1 less sodium
    2 less potassium
    3 less magnesium
    4 I don't know

33. Which of the following food-stuffs contains most potassium?
    1 fish
    2 vegetables and fruit
    3 vegetable oil
    4 I don't know

34. Which of the following may protect for elevation of blood pressure?
    1 sodium
    2 potassium
    3 iodine
    4 I don't know

35. The price of ordinary salt per kg in the shop is on an average
    1 20 pennies
    2 2 marks
    3 20 marks
    4 I don't know

36. From where do the Finns obtain most of their salt
    1 added at the table
    2 from salted fish
    3 added in preparation of the meal
    4 I don't know

MONICA PROJECT, FINLAND

III AMI AND STROKE REGISTER MANUAL

National Public Health Institute
Department of Epidemiology
Helsinki, 1981

CONTENTS

1. AMI REGISTER

General principles

The general aims and principles of the registration are described in the MONICA project protocol. The aim is to register every case of possible acute myocardial infarction (AMI) that occurs among the people below 65 years that live permanently in the monitoring areas. The search for modification uses several sources of information. For every case, information is collected using standardized procedures and special record forms. Among other things, information on diagnostic criteria is collected for centralized diagnostic classification in the local register centre using criteria presented here (follow the respective WHO protocol).

Sources of information

Normally, a case is found when a patient comes to a hospital or health centre with symptoms suggestive of a coronary attack. It is recommended that all such patients in the monitoring areas (as is usual in Finland) are admitted to the ward of the hospital or health centre. The local register centre ensures that record forms are systematically completed in every such institution in the area (usually by local register nurse).

Another major source of information is death certificate that are checked at least once a month. On such occasion every certificate is reviewed where the deceased was below 65, was an inhabitant of the area, and as cause of death is given:

- hypertension 401-405
- ischaemic heart disease 410-414
- other heart disease 420-429
- atherosclerosis 440-447
- diabetes 250

These death certificates are reviewed centrally by the register physician following the diagnostic criteria presented here.

In addition to the above sources, to find any possible missed cases of AMI, in-patient discharge cards of local hospitals and health centres are checked. Possible missed cases may also be detected from laboratory reports (heart specific enzymes) or autopsy reports. Complementary information can also be obtained from health insurance or from primary physicians or doctors of special institutions. If an inhabitant of the monitoring area suffers from a heart attack and is treated at a hospital outside the area, the treating hospital usually sends the patient's papers to local hospital for follow-up. This enables registration of such a case.

Diagnostic criteria

For final diagnostic classification, careful information is collected in a standardized way on the following criteria: symptoms, ECG findings, serum enzymes and necropsy findings (fatal cases). For fatal cases information on possible history of CHD is collected.

The register nurse interviews the patient on pain and other symptoms, or if not possible, obtains the respective information from patient's files. It should be noticed that notification of a case can primarily be due to other reasons than pain.

An ECG should be taken of all suspect cases during 1., 2., 3. and 4. days of hospitalization. The speed of the paper should be 50 mm/sec. All ECG readings or the copies needed for the diagnostic conclusions should be submitted to the local register centre for diagnostic classification of the case.

The diagnostic classification, primarily serum CK enzyme and its MB fraction (or ASAT or LD with its isoenzymes) should be analyzed. For full evaluation of the enzyme results, the onset of pain should be determined as exactly as possible. Each enzyme has its own typical pattern in a case of AMI; the schedule for blood sampling should be determined accordingly. Every register centre should agree on the choice of enzymes according to local conditions, on the blood drawing schedule and on diagnostic values according to WHO protocol recommendations presented later.

It is recommended that the autopsy rate should be as high as possible for fatal cases with possible CHD and that special attention should be paid to coronaries in the autopsy. The necropsy findings should be available in the register centre for the diagnostic classification. The criteria proposed by WHO are presented later.

The diagnostic criteria are coded centrally in each register centre (Joensuu for North Karelia, Turku and Loimaa for South-West Finland area) based on the information presented above. The results of this coding are written down in the record forms in the appropriate places. The criteria proposed by the WHO protocol and used in Finland are as follows:

1. Symptoms

At the onset of the present attack:

1.1 Typical - when chest pain is present, characterized by:

(i) duration of more than 20 minutes AND
(ii) no definite non-cardiac cause.

(Note: other characteristics are used clinically but as these are not always present they cannot be used in a definition).

1.2 Atypical

(i) one or more of the following
- Atypical pain
- Acute left ventricular failure
- Shock
- Syncope.

AND
(ii) the absence of cardiac disease other than ischaemic heart disease
AND
(iii) no definite non-cardiac cause.

2. Electrocardiogram

The ECG classification will be based on the reading of all records taken in the period following the acute attack and, if available, records taken immediately before.

2.1 Definite ECG

(A) The development in serial records of a diagnostic Q wave

- AND/OR -

(B) The evolution of an injury current which lasts more than one day in the presence of Q waves.

(Note: criterion B is included because diagnostic Q waves are already present in the first ECG recording in many cases.).

The interpretation of two or in some cases three ECG records is therefore necessary for the establishment of these categories.

An evolving pattern of changes (appearance or disappearance within lead groups: anterior (V_1-V_5), lateral (1, aVL, V6); inferior (11, 111, aVF) establishes the infarct as acute.

A. Development of Q waves

Progression of Q codes from no Q to equivocal or equivocal to diagnostic codes requires that serial change rules from the Manual of Operations be applied.

i) No Q or QS code in one ECG record followed by a record with a diagnostic Q or QS code (Minn. code 1-1-1 through 1-2-5 plus 1-2-7).

- OR -

ii) An equivocal Q or QS code (Minn. code 1-2-8 or any 1-3 code) and no major ST segment depression in one ECG record followed by a record with a diagnostic Q code PLUS a major ST segment depression (Minn. code 4-1 or 4-2)

- OR -

iii) An equivocal Q finding and no ST segment elevation in one ECG record followed by a record with a diagnostic Q code PLUS an ST segment elevation (Minn. code 9-2).

- OR -

iv) An equivocal Q finding no major T wave inversion in one ECG record followed by a record with a diagnostic Q code PLUS a major T inversion (Minn. code 5-1 or 5-2).

- OR -

v) No Q code and neither 4-1 nor 4-2 followed by a record with an equivocal Q code plus a 4-1 or 4.2.

- OR -

vi) No Q code and no 9-2 followed by a record with an equivocal Q-code plus a 9-2.

- OR -

vii) No Q code and neither 5-1 nor 5-2 followed by a record with an equivocal Q code plus a 5-1 or a 5-2.

- OR -

B. Evolution of injury current which lasts more than one day.

viii) An ST segment elevation (Minn. code 9-2) lasting more than one day

AND

T wave progression on three or more records from 5-0 to 5-3 to 5-2 or from 5-3 to 5-2 to 5-1.

2.2 Probable ECG

Evolution of repolarization changes which last more than one day (one or more of the following):

i) No major ST segment depression in one ECG record and other records with a major ST segment depression (Minn. Code 4-1).

ii) No ST segment elevation in one ECG record and other records with an ST segment elevation (Minn. Code 9-2).

iii) No major T wave inversion in one ECG code and other records with a major T wave inversion (Minn. Code 5-1 or 5-2).

2.3 Non-evolving (ischaemic) ECG

i) Minnesota code 1-1-1 to 1-2-5 or 1-2-7 for Q and QS patterns

- OR -

ii) Minnesota code 9-2 for ST segment elevation PLUS any T wave depression item coded 5-1 or 5-2.

- OR -

iii) Q and QS pattern 1-2-8 through 1-3-6

OR

iv) ST junction (J) and segment depression 4-1 through 4-3.

OR

v) T-wave items 5-1 through 5-3

- OR -

vi) ST segment elevation item 9-2.

2.4 Other ECG

i) All other ECG findings including normal ECG.

2.5 Uncodable ECG

2.6 ECG absent

3. Cardiac enzymes

Appropriate serum cardiac enzyme tests will be used whenever possible. Owing to differing local laboratory circumstances it will not be possible for this study to standardise the serum enzyme tests nor the reagents and methods employed. Each centre should, in cooperation with each local laboratory, define (1) the tests employed, and (2) local ranges of normal, equivocal and abnormal.

Abnormal: At least one serum enzyme level is more than twice the limits of normal when measured within 72 hours of onset of symptoms or admission.

Equivocal: Serum enzyme levels are raised but to less than twice the upper limit of normal.

Non-specific: Serum enzyme levels are raised above normal but there are probable explanations other than cardiac infarction, such as liver disease, infections, defibrillation or surgery.

Incomplete: Tests not done within 72 hours of onset of symptoms or admission.

Normal: Within normal limits.

4. Necropsy findings

The results of post-mortem examination which are recorded in the following section of data requirements for death provide the information for classification into:

Definite evidence of acute myocardial infarction: the presence of a fresh myocardial infarction and/or recent occlusion of a coronary artery (from ante-mortem thrombus, haemorrhage into an atheromatous plaque or embolism).
Note that this refers to the naked eye appearance of the heart.

Equivocal: signs of chronic ischaemic heart disease, namely, old myocardial infarction (scar) occlusion or severe stenosis (greater than 50% reduction of lumen) by mural atheroma of one or more coronary arteries in the absence of fatal disease outside the heart.

Negative: (a) the absence of macroscopic evidence of fresh myocardial infarction or recent occlusion of the coronary artery or (b) evidence of fatal disease outside the heart in the presence of chronic ischaemic heart disease.

Diagnostic classification

After the diagnostic criteria have been coded, as presented above, the final diagnostic classification is made by the centre and marked on the record form. This follows the recommendations of the WHO protocol. It should be noticed that the diagnostic conclusion may necessarily not be in accordance with the clinical diagnosis, since use of fixed quantitative criteria is essential for the study purposes. The diagnostic categories are as follows:

There are the following categories:

(1) definite acute myocardial infarction
(2) possible acute myocardial infarction or coronary death
(3) Ischaemic cardiac arrest with successful resuscitation not fulfilling criteria for definite or possible myocardial infarction
(4) no acute myocardial infarction or coronary death
(5) fatal cases with insufficient data.

Allocation of a diagnostic category must follow strictly the definitions provided. The categories used for the diagnosis of "definite" and "possible" acute myocardial infarction are not necessarily those that would be used by a clinician, but rigid definitions are essential for event analysis.

(1) Definite acute myocardial infarction

(a) Definite ECG or
(b) Symptoms typical or atypical, together with probable ECG and abnormal enzymes, or
(c) Symptoms typical and abnormal enzymes with non-evolving (ischaemic), or noncodable ECG or ECG not available, or
(d) Fatal cases, whether sudden or not, with naked-eye appearance of fresh myocardial infarction and/or recent coronary occlusion found at necropsy.

(2) Possible acute myocardial infarction or coronary death

(a) Living patients: with typical symptoms, whose ECG and enzyme results do not place them in category (1) and in whom there is no good evidence for another diagnosis for the attack, or

(b) fatal cases whether sudden or not (not in category 1) where there is no good evidence for another cause of death, clinically or at autopsy:
(i) with symptoms, typical or atypical; or
(ii) without typical or atypical symptoms, but with evidence of chronic coronary occlusion or stenosis or old myocardial scarring at necropsy; or
(iii) with a good history of chronic ischaemic heart disease such as definite or possible myocardial infarction, or coronary insufficiency or angina pectoris in the absence of valvular disease or cardiomyopathy.

(3) Ischaemic cardiac arrest with successful resuscitation not fulfilling criteria for definite or possible myocardial infarction. Spontaneous cardiac arrest not provoked by medical intervention, electrocution, drowning or other gross physical insults from presumed primary ventricular fibrillation secondary to ischaemic heart disease, in the absence of valvular disease or cardiomyopathy or other serious disease.

(4) No acute myocardial infarction

(a) Living patients (not in category (1)):
(i) probable, non-evolving, other, uncodable and absent ECG without typical symptoms or elevated enzymes, or
(ii) where illness episode has been explained by another diagnosis.

(b) Fatal cases, whether sudden or not, not in category (1) where another diagnosis has been made (clinically or at autopsy).

(5) Fatal cases with insufficient data

Cases with no autopsy, no history of typical or atypical symptoms, no previous history of chronic ischaemic heart disease and no other diagnosis. Living patients should not be allocated to this category. It is hoped that most centres will not need this category.

Instructions for the record forms

The record form is completed for every case of suspect AMI, if the subject is a resident of the monitoring area and is aged from 25 to 64 years. If the patient has a new attack within four weeks after onset of the previous attack, this is not registered as a new case. However, if the subject has after these four weeks a new attack, this is registered as a new case. If the patient dies later than four weeks after the onset of the attack (of another reason than new AMI), the case is not registered. (This information is obtained by record linkage from national death certificate register.)

The record form is completed by writing the required information in the given space or by entering the appropriate code number in the item box. The record form is initially completed by the register nurse (or another person) of the treating hospital or health centre. The initial information is collected as soon as possible. When the patient leaves the hospital or dies, but at the latest four weeks after the onset of symptoms, the follow-up part is completed. In case of death, the

respective part of the record form is also completed. The part of the form for register diagnostic information is, however, completed later by the register centre of the area. The completed record form is sent, together with the required diagnostic information (see record form) to the register centre of the area. There the register physician makes the coding of the diagnostic criteria and completes the diagnostic classification. Finally, the completed record forms are sent four times a year to the national register centre of the National Public Health Institute.

MONICA-project

HEART REGISTER

Part of international study, co-ordinated by WHO

National Public Health Institute Finland

INITIAL INFORMATION (to be completed as soon as possible after onset of attack)

Background information

1. Name of patient: _____

   address: _____

   telephone: _____

2. Name of spouse or nearest person alive: _____

   address: _____

   telephone: _____

3. Identification number [| | | | |] 1-5

4. National person code (includes date of birth) [| | | | | | | | | |] 6-15

5. Age [| |] 16-17

6. Sex [ ] 18
   1 male
   2 female

7. Municipality [| |] 19-20

01 Joensuu	14 Liperi	32 Alastaro
02 Outokumpu	15 Polvijärvi	33 Aura
03 Lieksa	16 Pyhäselkä	34 Karinainen
05 Nurmes	17 Rääkkylä	35 Mellilä
07 Eno	18 Tohmajärvi	36 Oripää
08 Ilomantsi	19 Tuupovaara	37 Punkalaidun
09 Juuka	20 Valtimo	38 Pöytyä
10 Kesälahti	21 Värtsilä	39 Vampula
11 Kiihtelysvaara	25 Turku	40 Yläne
12 Kitee	30 Loimaa	41 Ypäjä
13 Kontiolahti	31 Loimaan kunta	

8. Place of first treatment [| |] 21-22

01 NK Central Hospital	20 Turku University Central Hospital
02 Joensuu town hospital	21 Turku city hospital
03 Outokumpu, health centre	22 Other institution in Turku
04 Lieksa -"-	30 Loimaa regional hospital
05 Nurmes	31 Other institution in Loimaa region
06 Eno	90 Hospital elsewhere in Finland
07 Ilomantsi -"-	91 Treated only at home
08 Juuka -"-	92 Medically unattended (only sudden death cases)
09 Kitee -"-	
10 Liperi -"-	
11 Tohmajärvi -"-	
12 Kontiolahti -"-	
13 Other institution in NK	

9. Was the patient later transferred to central hospital? [ ] 23
   1 yes
   2 no

10. Type of work (present or before retirement) [ ] 24
    1 agriculture
    2 forestry
    3 instustrial, mining, construction etc.
    4 office work, service work, student etc.
    5 housewife
    6 pensioned
    7 unemployed

11. Work status prior to attack [ ] 25
    1 was working during 3 months prior to attack
    2 was not working, but this was due to non-medical reason
    3 unable to work, health insurance payment
    4 unable to work, disability payment
    5 retired because of age

12. History of MI [ ] 26
    1 yes, confirmed
    2 yes, not confirmed
    3 no

13. If yes, year of previous AMI 19 [|] 27-28

14. First source of notification (that led to registration) [ ] 29
    1 admitted to hospital ward
    2 admitted to out-patient clinic only
    3 autopsy report
    4 death certificate
    5 laboratory report
    6 health insurance report
    7 other notidication (from primary physician, old people's home etc.)

15. Current smoking (prior to attack, if smoked during 3 months prior to attack). Number of cigarettes, cigars and pipefulls per day). [|] 30-31

16. Date of onset of attack [| | | | | |] 32-37
day month year

17. State of patient at first examination [ ] 38

1 alive
2 cardiac arrest
3 dead (includes unsuccessful resuscitation)

FOLLOW-UP INFORMATION (TO BE COMPLETED WHEN PATIENT IS DISCHARGED FROM NO LATER THAN 28 DAYS AFTER ONSET OF SYMPTOMS)

18. State of patient at 28 days [ ] 39

1 alive
2 dead

19. Was the patient under systematic rehabilitation during hospitalization [ ] 40

1 yes
2 no

Complications since first examination

20. Cardiac arrest [ ] 41

1 yes
2 no

21. If resuscitation, was it successful (the patient lived at least 24 hours after that) [ ] 42

1 yes
2 no
3 no resuscitation

Register diagnostic information
(to be completed by the register centre)

22. History of pain (symptoms) [ ] 43

1 typical
2 atypical
3 none
9 no data

23. ECG-findings [ ] 44

1 definite
2 probable
3 non-evolving
} By which criteria of the protocol [ ] 45
4 other
5 uncodable
9 no data

Localisation (separate coding instructions) [ ] 46

24. Serum enzymes [ ] 47

1 abnormal
2 equivocal
3 nonspecific
4 normal
5 incomplete
9 no data

25. Necropsy findings [ ] 48

1 definite
2 possible
3 negative
4 no autopsy
9 insufficient data

26. Diagnostic category [ ] 49

1 definite
2 possible
3 primary ischaemic cardiac arrest (if not 1 or 2)
4 none
9 insufficient data (only fatal cases)

Clinical diagnosis

27. Main dg (ICD-code) according to patient's clinical evaluation or death certificate [| | | |] 50-54
Diagnoses leading or influencing to the above [| | | |] 55-59
[| | | |] 60-64

Laboratory etc. results (if available)

28. Weight (kg) [| |] 65-67

29. Height (cm) [| |] 68-70

30. S-cholesterol (mmol/l, first value) [|] 71-73

S-HDL-cholesterol (mmol/l, first value) [|] 74-75

31. S-CK (U/l, greatest value) [| | |] 76-79

MB% [ ] 80-81

S-ASAT (U/l, greatest value) [| | |] 82-85

FATAL CASES ONLY (TO BE COMPLETED IF PATIENT DIED DURING 28 DAYS SINCE ONSET OF ATTACK)

32. Date of death ☐☐☐☐☐☐ 86-91

33. Survival time ☐ 92

1 0-59 minutes
2 1-23 hours
3 24 hours or more
4 apparently less than 24 hours
5 apparently 24 hours or more
9 no information

34. Was autopsy done ☐ 93

1 yes, medical
2 yes, forrensic medicine
3 no

35. History of prior CHD

1 definite or possible AMI (as quest. 12)
2 confirmed CHD
3 possible CHD
4 obviously no history of CHD
5 no information

Diagnostic data

36. History and medication of CHD (only fatal cases)

37. Description of present pain symptoms (see text next page)

1 localisation

2 duration

3 impact of nitro

4 intensity and use of analgetics

38. Diagnostic laboratory results with dates

date	CK	CK-MB(%)	ASAT	LD

39. ECG (see text next page)

2. STROKE REGISTER

General principles

The aim is to register every possible case of stroke that occurs among people aged 25-74 years and who live permanently in the monitoring areas. The registration does not concern TIA-attacks (duration of symptoms less than 24 h) or non-fatal manifestations of chronic cerebrovascular diseases.

Registration criteria

Following criteria should be met for registration:

1) The subject must be a resident of the monitoring area and be aged from 25 to 74 at the onset of the attack
2) The attack must have started at least 28 days since a previous stroke attack leading to registration
3) The attack must fulfill the clinical definition of stroke (see below)

Definition of stroke

Stroke is defined as rapidly developed clinical signs of focal (or global) disturbance of cerebral function ("global" - applies to patients with subarachnoid haemorrhage and to some patients in deep coma, but does not include systemic circulatory failure, e.g. shock, Stokes-Adams syndrome, or hypertensive encephalopathy), lasting more than 24 hours or leading to death, with no apparant cause other than a vascular origin; it includes patients presenting clinical signs and symptoms suggestive of subarachnoid haemorrhage, intracerebral haemorrhage, or cerebral ischaemic necrosis. It does not include transient cerebral ischaemia.

After primary registration the role of the local register centre is to exclude "false positive" cases, i.e. cases that have clinically been diagnosed as stroke but that the register centre considers to be something else. This final classification is carried out by the register physician of the centre using all available information. The clinical diagnosis of the treating physician or doctor is entered in the record form under item 21. The final classification of the register centre is entered on the form under item 25 and 26.

The registration must pay attention also to possible "false negative" cases. This takes place according to special instructions at certain intervals (especially by the register centre reviewing cases where death certificates and discharge information have given diagnosis ICD-code 435.

Choice of cases and sources of information

The aim is to organize the registration so that all cases of stroke among the residents will be registered. For every registered case all needed diagnostic and other information will be collected.

The main first source of information is patient's arrival at hospital (alive or dead). The first part of the record form (initial information) will be completed by the hospital that first admits the patient. Four week follow-up information or information on fatal outcome is given by the hospital where patient is during time of follow-up or death. After the record form has been completed by hospital or health centre, it is sent to the register centre of the area. This centre is in North Karelia at the Department of neurology of the NK Central Hospital, in Turku at the city register centre (together with AMI register) and in Loimaa at the Dept. of Internal Medicine of the Loimaa Regional Hospital. In the cases to be registered the clinical diagnosis is usually ICD 430-434 or 436; sometimes it may be also 435, 437 or 438. In addition to this the register centre attempts to find also other cases of stroke occurring among the population of the area. The most important supplementary source of information is death certificate. The register centre receives copy of death certificate of all deaths with cause of death coded as 430-438. The register physician decided which of these cases are registered as stroke using the given criteria (if these cases have not yet been registered). The register centre may also obtain information from other supplementary sources (primary care doctors, old people's homes, health insurance etc.).

Instructions for the record forms

The record form will be completed for every possible case of stroke, if the subject lives permanently in the monitoring area (item 7) and

is aged from 25 to 74 years. If the patient gets a new stroke within four weeks since onset of previous attack, this is not registered a new case. If, however, the patient gets a new stroke after this four week period, it is registered as a new case. If the patient dies within four weeks after onset of symptoms, also the last part of the record form (for fatal cases only) is completed. If the patient dies later than four weeks after the onset of symptoms, this is not registered. (This information will be obtained by record linkage from national death certificate register.)

The record forms will be completed by one treating institution (except for items 24 and 26). The completed record forms are sent as soon as possible to the register center of the area. A copy of patient's medical record and of autopsy record is enclosed with the record form. At the register centre, the register physician completes items 25 and 26. Finally the completed records are sent four times a year to the national register centre of the National Public Health Institute.

MONICA-project

STROKE REGISTER

Part of international study,
co-ordinated by WHO
National Public Health Institute
Finland

INITIAL INFORMATION (to be completed as soon as possible after onset of attack)

Background information

1. Name of patient: _____

   address: _____

   telephone: _____

2. Name of spouse or nearest person alive: _____

   address: _____

   telephone: _____

3. Identification number [ ][ ][ ][ ][ ][ ] 1-5

4. National person code (includes date of birth) [ ][ ][ ][ ][ ][ ]-[ ][ ][ ][ ] 6-15

5. Age [ ][ ] 16-17

6. Sex [ ] 18
   1 male
   2 female

7. Municipality [ ][ ] 19-20

01 Joensuu	14 Liperi	32 Alastaro
02 Outokumpu	15 Polvijärvi	33 Aura
03 Lieksa	16 Pyhäselkä	34 Karinainen
05 Nurmes	17 Rääkkylä	35 Mellilä
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10 Kesälahti	21 Värtsilä	39 Vampula
11 Kiihtelysvaara	25 Turku	40 Yläne
12 Kitee	30 Loimaa	41 Ypäjä
13 Kontiolahti	31 Loimaan kunta	

8. First source of notification (that led to registration) [ ] 21

   1 admitted to hospital ward
   2 admitted to out-patient clinic only
   3 autopsy report
   4 death certificate
   5 laboratory report
   6 health insurance report
   7 other notidication (from primary physician, old people's home etc.)

9. Place of first treatment [ ][ ] 22-23

01 NK Central Hospital		20 Turku University Central Hospital
02 Joensuu town hospital		21 Turku city hospital
03 Outokumpu, health centre		22 Other institution in Turku
04 Lieksa	-"-	30 Loimaa regional hospital
05 Nurmes		31 Other institution in Loimaa region
06 Eno		90 Hospital elsewhere in Finland
07 Ilomantsi	-"-	91 Treated only at home
08 Juuka	-"-	92 Medically unattended (only sudden death cases)
09 Kitee	-"-	
10 Liperi	-"-	
11 Tohmajärvi	-"-	
12 Kontiolahti	-"-	
13 Other institution in NK		

10. Place of living prior to attack [ ] 24

    1 home
    2 central hospital
    3 regional hospital
    4 health centre ward or town hospital
    5 municipal institution for elderly sick people
    6 old people's home
    7 other institution

11. Home situation [ ] 25

    1 lives alone
    2 lives together with others
    3 permanently institutionalized

12. Situation prior to attack [ ] 26

    1 working or if not working this was due to other than health or age reasons
    2 unable to work because of health reasons
    3 retired, but did not require help in self-care
    4 retired and needed help in self-care

13. History of MI (more than 28 days before the attack) [ ] 27

    1 no
    2 yes

14. History of stroke (more than 28 days before the attack) [ ] 28

    1 no
    2 yes

15. Has blood pressure been measured (more than 28 days before the attack) [ ] 29

    1 no
    2 yes, normal
    3 yes, elevated or under antihypertensive medication
    4 yes, low
    5 yes, result not known

16. Date of onset of attack [ ][ ][ ][ ][ ][ ] 30-35

FOLLOW-UP INFORMATION (TO BE COMPLETED WHEN PATIENT IS DISCHARGED OR DIES AND NO LATER THAN 28 DAYS AFTER ONSET OF SYMPTOMS)

17. Management at follow-up ☐ 36

1 home
2 central hospital
3 regional hospital
4 health centre or town hospital
5 municipal institution for elderly sick people
6 old people's home
7 other institution
8 dead

18. Was the patient under systematic rehabilitation during hospitalization? ☐ 37

1 no
2 yes

19. Does the patient need help in self-care? ☐ 38

1 no
2 yes, to some degree
3 yes, completely
4 dead

20. Examinations 1 = yes, 2 = no

a) physician ☐ 39
b) internist ☐ 40
c) neurologist ☐ 41
d) lumbar puncture ☐ 42
e) angiography ☐ 43
f) brain scanning ☐ 44
g) EEG ☐ 45
h) echo EG ☐ 46
i) ECG ☐ 47
j) computerized axial tomography ☐ 48
k) other, what ☐ 49

21. Duration of neurological defect symptoms

1 less than 7 days
2 7 days or more

22. Clinical diagnosis or diagnosis of death (stroke) ICD-code ☐☐☐☐☐ 51-55

Diagnoses leading or influencing to above ☐☐☐☐☐ 56-60

☐☐☐☐☐ 61-65

27. Description of symptoms (location, duration)

_____

_____

_____

_____

_____

_____

FATAL CASES ONLY (TO BE COMPLETED IF PATIENT DIED WITHIN 28 DAYS SINCE ONSET OF ATTACK)

23. Date of death ☐☐☐☐☐☐ 66-71

24. Survival time (days) ☐☐ 72-73

25. Was autopsy done ☐ 74

1 no
2 yes, medical
3 yes, forrensic medical

REGISTER DIAGNOSIS (TO BE COMPLETED BY REGISTER CENTRE)

25. Stroke ☐ 75

1 yes
2 no
3 insufficient information

26. Type of stroke (ICD-code) ☐☐☐☐☐ 76-80