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

CONTENTS:

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OF CARDIOVASCULAR DISEASES IN FINLAND
(PART OF A JOINT WHO STUDY)
-THE MONICA PROJECT

CONTENTS:

PROTOCOL AND MANUAL

FINMONICA: MONITORING TRENDS AND DETERMINANTS
IN CARDIOVASCULAR DISEASE IN FINLAND

FINNISH PART OF THE WHO CO-ORDINATED
MONICA PROJECT

FINMONICA PROTOCOL AND MANUAL CONTENTS

I GENERAL PROTOCOL OF THE PROJECT CONTENTS

1. BACKGROUND
2. AIMS AND OBJECTIVES
3. MONITORING AREAS, POPULATION AND MORTALITY
4. GENERAL DESIGN
5. PROJECT ORGSANIZATION, TIME-TABLE AND RESOURCES
6. DATA PROCESSING AND REPORTING

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 have 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 with lower mortality rates in the west and south-west of Finland than in the east of Finland. The increase in coronary artery disease mortality until late 1960s seems to have occured 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) has improved. Smoking among men has become less popular 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 national mortality statistics it is possible to follow CVD in Finland with the help of a register based on hospital discharges and through the national disability imbursements awarded by the Social Insurance Institution. The use of discharge report records in the 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.

Acute AMI register has been in operation in several locations 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 AMI which lead to hospital treatment in the population of the registered area. The AMI 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. Population studies carried out by the Social Insurance Institution have provided a relatively good cross-section risk factor levels of the Finnish population. Risk factor surveys have been also carried out in Eastern Finland as the part of the North Karelia project. Also an east-west comparison was made in the initial studies 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 the risk factor levels correspond with the improving trend in CHD.

WHO has launched the international MONICA study to continue from the previous cross-sectional studies of differences in AMI 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 medical care practices in addition to certain psychosocial factors in defined populations during a sufficiently long period of time.

2. AIMS AND OBJECTIVES

The aim of the study in Finland (FINMONICA) is to follow the trends in CVD and total mortality as well as AMI and stroke incidence in communities selected for the study in Eastern and Western Finland. A further aim is to investigate the degree to which these trends are associated with changes in known risk factors, the health behaviour of the population, medical care and the major socioeconomic factors. One aim of the study is also to have Finland participate in the international WHO MONICA Project.

The FINMONICA goal is to study which of the following hypotheses are valid:
A possible change in CVD mortality is associated with 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) medical care 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 associated with a change in the following risk factors in the study population:
a) smoking,
b) the blood pressure level (changing due to environmental changes and/or the follow-up and treatment of persons with high blood pressure),
c) the lipid levels, in connection with
d) nutritional habits (changes in the energy intake, the use of saturated and polyunsaturated fats, cholesterol and salt)
e) body mass and physical activity
f) combinations of the above risk factors.

The major null-hypotheses of the international study are:

Main null hypothesis.   There is no relationship between:
- 10 year trends in coronary risk score derived from a 3 factor logistic equation for serum cholesterol, diastolic blood pressure and smoking
- AND
- 10-year trends in incidence (fatal plus non-fatal attack rates for coronary heart disease).

Second main null hypothesis: There is no relationship between:
- 10year trends in case fatality (percentage of attacks that are fatal within 28 days) AND
- 10-year trends in medical care for the attack (the index of this has yet to be decided).

3. MONITORING AREAS, POPULATION AND MORTALITY

The monitoring areas are: in Eastern Finland the county of North Karelia , where
the disease registers have operated since 1972 and where the follow-up of the
development is important because of the North Karelia project (population base c.
175 000), the county of Kuopio where AMI and stroke registers have been established
since the beginning of 1983. The population of the Kuopio county is about 253 000.
The Kuopio county has been the reference area of the North Karelia project since
1972 but without AMI and stroke registers before 1983.

In South-Western Finland the monitoring area includes the city of Turku and a group
of municipalities in the Loimaa region. Turku, where the AMI register has been in
operation earlier, 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.

The FINMONICA areas are shown in figure 1 and the total population covered by
FINMONICA is given in table 1.
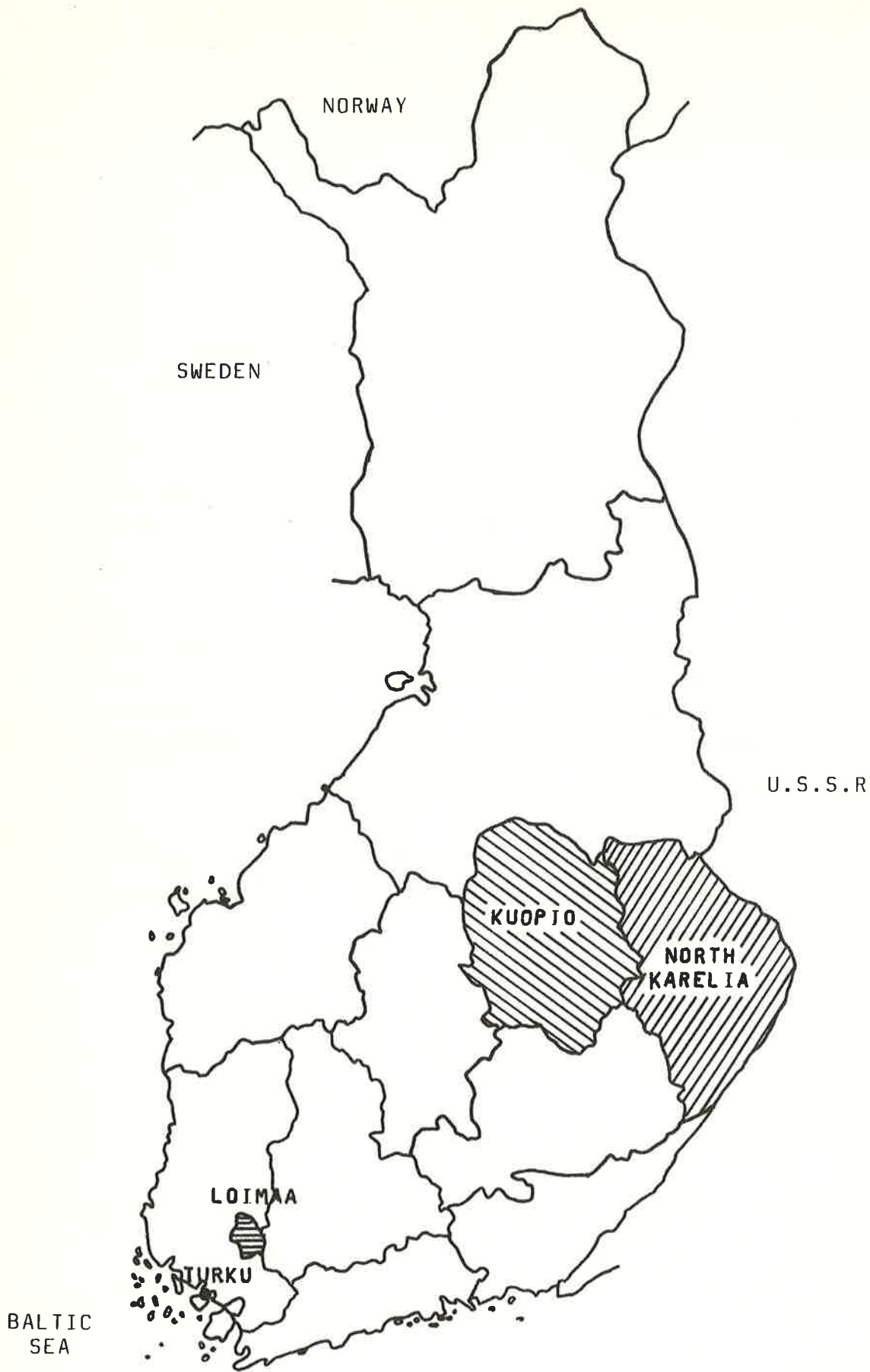
FIGURE 1. FINLAND AND ITS 11 COUNTIES AND THE 3 FINMONICA AREAS:
NORTH-KARELIA, KUOPIO COUNTY AND TURKU & LOIMAA

Age group	Number of men	Number of women	Total
25-29	28 264	25 723	53 987
30-34	29 426	25 792	55 216
35-39	21 137	19 563	40 699
40-44	18 539	17 939	36 478
45-49	17 567	17 821	35 608
50-54	19 088	20 005	39 093
55-59	16 374	20 049	36 423
60-64	12 640	17 781	30 421
TOTAL	**163 035**	**164 673**	**327 925**

TABLE 1.   MEAN POPULATION FOR THE YEAR 1981 IN THE TOTAL FINMONICA AREA (all ages 633 442)

3.1 North Karelia

North Karelia county is situated in the eastern part of the country along the border between Finland and Soviet Union. The total area includes land 17 782 km^2 and lakes 3 803 km^2. The population of North Karelia is about 177 000. The county is divided into 19 municipalities. The capital and the only major town, Joensuu, has a population of 43 000. About 40 000 inhabitants are living in the three other semi-urban areas and the rest in the rural districts. Migration out of the county, movement to urban areas and rapid change of the occupational structure took place during the 60's and 70's. A relatively low income level and high unemployment are still common features in North Karelia. Small scale farming and forestry are the main sources of livelihood although the proportion of service industries has rapidly increased. 80 per cent of the land area are covered by forests. The industrialization is still in a low level and mainly based on farming and lumber industries.
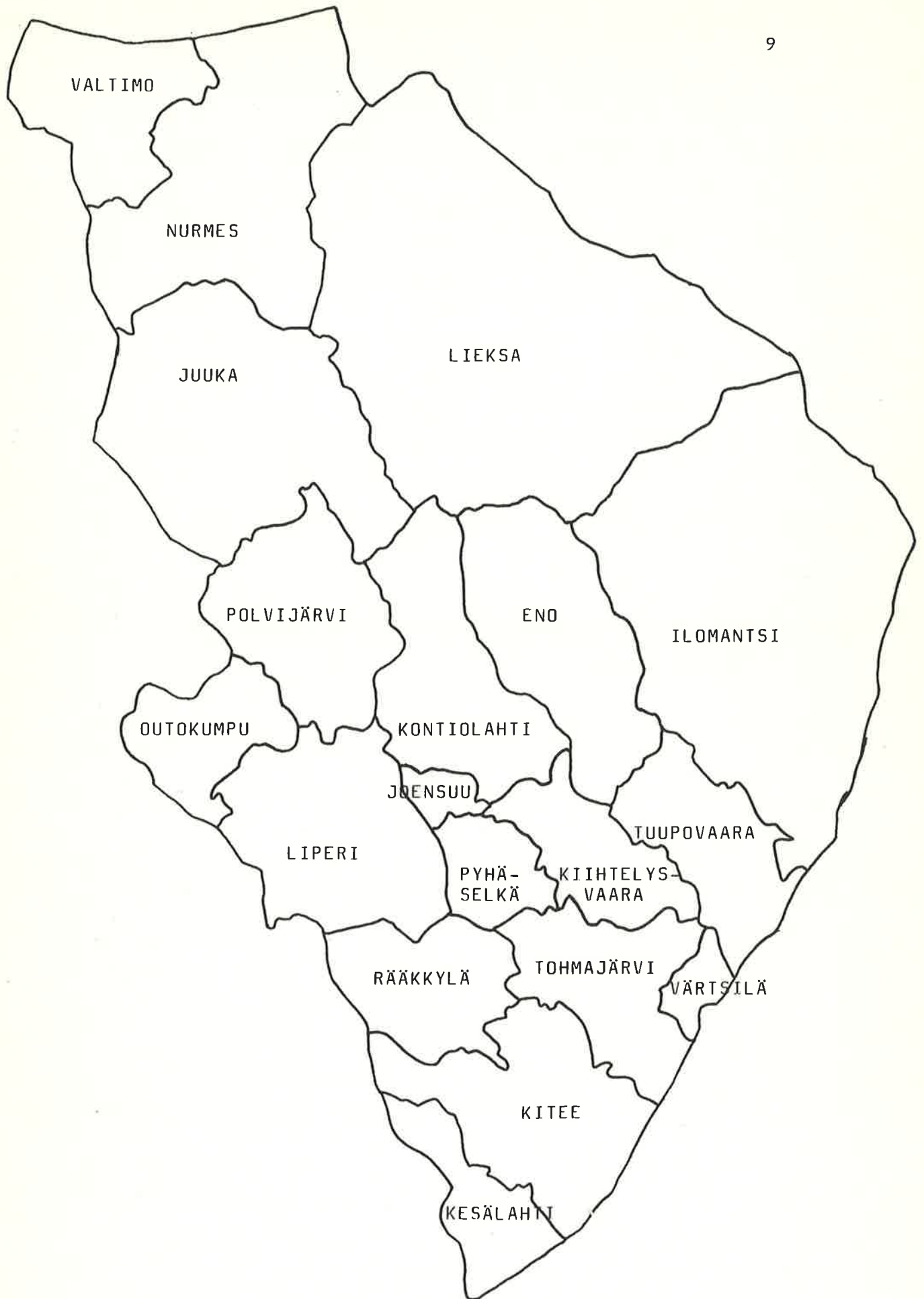
FIGURE 2. THE NORTH KARELIA COUNTY WITH ITS MUNICIPALITIES

Age group	Number of men	Number of women	Total
25-29	8078	6721	14 799
30-34	8047	6601	14 647
35-39	5838	5118	10 956
40-44	5171	4798	9 969
45-49	5012	4743	9 755
50-54	5359	5464	10 823
55-59	4652	5420	10 072
60-64	3631	4823	8 454
TOTAL	45 788	43 688	89 476

TABLE 2.   MEAN POPULATION FOR THE YEAR 1981 IN NORTH KARELIA
(all ages 176 728)

The North Karelia Central Hospital in Joensuu has 663 hospital beds altogether. The department of medicine has 161 hospital beds. A coronary care unit consists of 18 beds. The department of neurology has 54 beds.

The Central Hospital is treating about 60 per cent of AMI patients in the county. The rest of the patients are treated in the general wards of the 11 health centre hospitals.

The number of hospital beds in North Karelia County are:

	Dept of Medicine	CCU	Dept of Neurology
NK Central Hospital	161	18	54
Joensuu City Hospital	136		
Outokumpu Health Centre	63		
Lieksa Health Centre	83		
Nurmes Health Centre	48		
Eno Health Centre	37		
Ilomantsi Health Centre	59		
Juuka Health Centre	30		
Kitee Health Centre	57		
Liperi Health Centre	35		
Tohmajärvi Health Centre	28		
Kontiolahti Health Centre	30		

Total number of hospital beds   767

3.2. Kuopio County

The county of Kuopio is the neighbouring county of North Karelia to the West. The total area of the county is 19 980 km^2 of which 16 700 km^2 is land. It is a typical lake district and 84 per cent of the land area is forest. The population of the county is about 250 000. Kuopio is the capital and there are 3 other towns and 20 rural municipalities. Half of the population is living in urban and half of it in rural areas. Forestry and lumber industries are the main sources of livelihood. The social, occupational and geographic features resemble closely those of North Karelia. The capital of the county, Kuopio , has about 73 000 inhabitants, being the important administrative centre of the whole Eastern Finland. Kuopio is also the economical and cultural centre of the area. The University of Kuopio which has a medical faculty was founded in 1972.

FIGURE 3. KUOPIO COUNTY WITH ITS MUNICIPALITIES

Age group	Number of men	Number of women	Total
25-29	11 159	9762	20 921
30-34	11 265	9729	20 993
35-39	8 162	7546	15 707
40-44	7 539	7302	14 841
45-49	7 065	7065	14 141
50-54	7 743	7867	15 610
55-59	6 528	7772	14 300
60-64	4 929	6776	11 705
TOTAL	64 365	63 819	128 218

TABLE 3.   MEAN POPULATION FOR THE YEAR 1981 IN KUOPIO COUNTY
(all ages 252 387)

The hospital network of the county consists of Kuopio University Central Hospital, 2 district hospitals - in Varkaus and in Iisalmi - and 21 wards within health centres.

Kuopio University Central Hospital has 986 beds altogether. The Department of Medicine has 126 beds, the coronary care unit 8 beds and the Department of Neurology 40 beds.

Both district hospitals have medical departments. The Department of Medicine in the Iisalmi District Hospital has 63 beds and that in the Varkaus District Hospital has 43 beds. Varkaus also has a coronary care unit with 4 beds.

In 1982 41 % of the patients with acute myocardial infarction in the Kuopio county were treated in the University Central Hospital, 30 % in the two district hospitals and 29 % in the health centre wards.

The number of hospital beds in Kuopio County are:

	Hospital beds	CCU	Department of neurology
Kuopio University Central Hospital	986	8	40
Kuopio Health Centre	116		
Iisalmi District Hospital	63		
Iisalmi Health Centre	80		
Juankoski Health Centre	16		
Kaavi Health Centre	21		
Karttula Health Centre	30		
Keitele Health Centre	15		
Kiuruvesi Health Centre	56		
Lapinlahti Health Centre	40		
Leppävirta Health Centre	92		
Nilsiä Health Centre	35		
Pielavesi Health Centre	40		
Rautalampi Health Centre	18		
Rautavaara Health Centre	20		
Siilinjärvi Health Centre	40		
Sonkajärvi Health Centre	40		
Suonenjoki Health Centre	40		
Tuusniemi Health Centre	30		
Varkaus District Hospital	43	4	
Varkaus Health Centre	78		
Vesanto Health Centre	30		
Vehmersalmi Health Centre	15		
Total number of hospital beds	**1089**		

3.3. South-Western Finland

The monitoring area of South-Western Finland consists of two parts: the City of Turku and a rural area consisting of 12 municipalities around Loimaa.

Turku is the third largest city of Finland. It is located in the South-Western corner of the country by the Baltic Sea. Turku is the former capital of Finland and the oldest city of the country. It is the administrative and economic centre of the Turku and Pori County. It has one of the biggest harbours of the country and is connected by several passenger ferries to Stockholm, Sweden. Turku has two universities and one medical faculty. The area of the city is 237 km^2. There are about 175 000 inhabitants comprising the urban population of the South-Western Finland area.

The Loimaa District Hospital is owned by 22 municipalities of which the 12 selected municipalities use the Loimaa District Hospital almost exclusively for AMI and stroke cases.

The city of Loimaa is the centre of this mainly agricultural area. About 43 530 inhabitants are living in this area which is located 65 km northeast of Turku and 160 km northwest of Helsinki.

FIGURE 4. LOIMAA REGION WITH ITS MUNICIPALITIES

Age group	Number of men	Number of women	Total
25-29	9027	9240	18 267
30-34	10 114	9462	19 576
35-39	7137	6899	19 576
40-44	5829	5839	11 668
45-49	5479	6013	11 492
50-54	5986	6674	12 660
55-59	5194	6857	12 051
60-64	4080	6182	10 262
TOTAL	52 846	57 166	110 012

TABLE 4.   MEAN POPULATION FOR THE YEAR 1981 IN THE SOUTH-WESTERN AREA (all ages 204 327)

In Turku all AMI patients under 65 years of age are treated in Turku University Central Hospital. The hospital has 1071 beds altogether of which 168 beds belong to the Department of Medicine. The coronary care unit has 6 beds, the Department of Neurology 51 beds. Most of the stroke cases are treated at the Turku City Hospital which has 696 beds altogether, 478 of which are in internal wards.

Loimaa District Hospital has 113 beds in the Department of Medicine where AMI and stroke patients are treated. There is a coronary care unit with 4 beds in the hospital.

There are 4 health centre hospitals in the Loimaa area with small wards having 132 beds in total. AMI or acute stroke patients are treated in these wards only exceptionally.

The hospital beds in Depts. of Medicine and Neurology and in the CCU in the cities of Turku and Loimaa are as follows:

	Dept of Medicine	CCU	Dept. of Neurology
Turku University Central Hospital	168	6	51
Turku City Hospital	478		
Loimaa Regional Hospital	113	4	
Total number of beds	**759**		

3.4. Mortality

Mortality data given in the following tables are collected from official statistics in Finland provided by the Central Statistical Office in Finland. Mortality data by age, sex, province, municipality and cause of death are continuously collected by the Office and become available after about 2 years delay. The Central Statistical Office also collects official population data which become available by July the following year.

The following tables show the mortality rates in the FINMONICA areas in 1980.

MALES AND FEMALES

Age group	Total deaths	Total CVD deaths	401-405	410-414	420-429	430-438	440-447
25 - 29	64	2	—	—	—	2	—
30 - 34	85	12	—	5	3	3	1
35 - 39	73	19	—	7	4	8	—
40 - 44	132	44	—	28	4	12	—
45 - 49	151	68	1	44	1	22	—
50 - 54	287	136	2	104	12	13	5
55 - 59	399	174	5	136	4	25	4
60 - 64	516	278	4	206	14	47	7
Total	1 707	733	12	530	42	132	17

TABLE 5. MORTALITY RATES IN THE TOTAL FINMONICA AREA IN 1980: BOTH SEXES COMBINED

MALES

Age group	Total deaths Males	Total CVD deaths Males	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	46	1	-	-	-	1	-
30 - 34	64	10	-	5	3	2	-
35 - 39	52	13	-	7	4	2	-
40 - 44	91	33	-	25	4	4	-
45 - 49	114	56	1	38	1	16	-
50 - 54	217	118	2	94	9	8	5
55 - 59	283	138	4	110	2	19	3
60 - 64	334	193	-	161	6	21	5
Total	1 201	562	7	440	29	72	13

FEMALES

Age group	Total deaths Females	Total CVD deaths Females	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	18	2	-	-	-	2	-
30 - 34	21	2	-	-	-	1	1
35 - 39	21	6	-	-	-	6	-
40 - 44	41	11	-	3	-	8	-
45 - 49	37	12	-	6	-	6	-
50 - 54	70	18	-	10	3	5	-
55 - 59	116	36	1	26	2	6	1
60 - 64	182	85	4	45	8	26	2
Total	506	175	5	90	13	60	4

TABLE 6. MORTALITY RATES IN THE TOTAL FINMONICA AREA IN 1980: MEN AND WOMEN

MALES

Age group	Total deaths Males	Total CVD deaths Males	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	20	1	-	-	-	1	-
30 - 34	19	6	-	3	1	2	-
35 - 39	16	5	-	4	1	1	-
40 - 44	28	9	-	7	1	1	-
45 - 49	37	18	1	10	1	5	-
50 - 54	81	49	2	33	4	5	3
55 - 59	85	46	1	38	-	6	-
60 - 64	110	65		55	2	4	4
Total	396	200	3	150	10	25	7

FEMALES

Age group	Total deaths Females	Total CVD deaths Females	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	6	1	-	-	-	1	-
30 - 34	4	1	-	-	-	-	-
35 - 39	5	2	-	-	-	2	-
40 - 44	9	4	-	-	-	4	-
45 - 49	7	2	-	-	-	2	-
50 - 54	19	6	-	5	1	-	-
55 - 59	28	13	-	11	1	-	1
60 - 64	48	25	1	11	1	7	1
Total	126	54	1	27	3	16	2

TABLE 7.   MORTALITY RATES IN NORTH KARELIA IN 1980

MALES

Age group	Total deaths Males	Total CVD deaths Males	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	17	-	-	-	-	-	-
30 - 34	26	3	-	2	1	-	-
35 - 39	20	7	-	3	3	1	-
40 - 44	42	18	-	14	2	2	-
45 - 49	48	26	-	20	-	6	-
50 - 54	79	44	-	37	2	2	1
55 - 59	120	60	3	48	1	6	1
60 - 64	175	80	-	63	2	11	2
Total	487	238	3	187	11	28	4

FEMALES

Age group	Total deaths Females	Total CVD deaths Females	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	7	1	-	-	-	1	-
30 - 34	8	1	-	-	-	1	-
35 - 39	10	3	-	-	-	3	-
40 - 44	17	3	-	1	-	1	-
45 - 49	16	4	-	1	-	3	-
50 - 54	25	5	-	3	1	1	-
55 - 59	40	11	-	9	-	1	-
60 - 64	78	40	1	22	4	12	-
Total	201	68	1	36	5	23	0

TABLE 8.   MORTALITY RATES IN KUOPIO COUNTY IN 1980

MALES

Age group	Total deaths Males	Total CVD deaths Males	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	9	–	–	–	–	–	–
30 - 34	19	1	–	–	1	–	–
35 - 39	16	–	–	–	–	–	–
40 - 44	21	6	–	4	1	1	–
45 - 49	29	12	–	8	–	5	–
50 - 54	57	25	–	24	3	1	1
55 - 59	78	32	–	24	1	7	2
60 - 64	89	48	–	43	2	6	–
Total	318	123	0	103	8	20	3

FEMALES

Age group	Total deaths Females	Total CVD deaths Females	ICD 401-405	ICD 410-414	ICD 420-429	ICD 430-438	ICD 440-447
25 - 29	5	–	–	–	–	–	–
30 - 34	9	–	–	–	–	–	1
35 - 39	6	3	–	–	–	1	–
40 - 44	15	4	–	2	–	3	–
45 - 49	14	6	–	–	–	1	–
50 - 54	26	7	–	2	1	4	–
55 - 59	48	12	1	6	1	5	–
60 - 64	56	20	2	12	3	7	1
Total	179	52	3	22	5	21	2

TABLE 9. MORTALITY RATES IN THE SOUTH-WESTERN AREA IN 1980

4. GENERAL DESIGN

The FINMONICA project can be divided into three main parts: 1) monitoring of incidence of and mortality from AMI and stroke by event registration and monitoring deaths by death certification, 2) monitoring of the levels of CVD risk factors and some other parameters using randomized surveys of selected population samples in 1982, 1987 and 1992 and small-scale postal surveys annually, and 3) monitoring of acute coronary care in the treatment of acute myocardial infarction. In connection with the FINMONICA, additional information is collected and supplementary studies performed for the international optional MONICA studies and for other purposes.

4.1. Monitoring the incidence and mortality of AMI and stroke

A stroke and AMI register has been in operation in North Karelia and an AMI register in the city of Turku since 1971. The diagnostic classification of the AMI cases used at both centres has been based on the recommendations for the WHO AMI register study. In North Karelia data have been collected both from the North Karelia Central Hospital and from the health centres. In the city of Turku all the heart attacks have been treated at the Turku University Central Hospital. One nurse and one ward assistant have been in charge of data collection for the registers. In North Karelia the register personnel have been employed by the Central Hospital and in Turku by the municipality. Trained nurses in the North Karelian health centres collected the primary data on the patients treated there.

The data processing for the North Karelia registration was carried out at the computer centre of the University of Kuopio. In Turku the municipali authorities were responsible for the data processing of the register information.

The data collection for the stroke register operating in North Karelia has been carried out in the health centres by the same nurses as for the AMI 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 work and diagnoses at discharge. The collected data were sent directly to Kuopio from the initial site of treatment.

Year 1981 was the period of pilot preparation for the MONICA project. In the beginning of 1981 the stroke register was started in the city of Turku and the AMI and stroke registers were started in the Loimaa region. At the same time the registers in North Karelia shifted to the use of a nationally uniform record form. The collection of data on all deaths was begun in the monitoring areas at that times

too. The data management became the responsibility of the National Public Health Institute (the data processing was first started in the data management 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.

FINMONICA was started in the beginning of 1982 when some further changes in methods and criteria were made in the registration in accordance with the international protocol of MONICA. The county of Kuopio started the registration of AMI events in November 1982 and of stroke events at the beginning of the year 1983 using the same methods and criteria as used in the other FINMONICA study populations.

The registration of AMI and stroke in North Karelia, Turku, the Loimaa region and Kuopio is operationally very similar to the registration in North Karelia and in Turku before the FINMONICA project. AMI from people (under 65 years) and stroke events from people (under 75 years) are registered among the population permanently residing in these areas. Subsequent attacks within a period of 28 days for the same person are not regarded as a new event. The data collection centres in each area collect standardized data on all possible cases of AMI and stroke among the population of the area. This includes data on diagnostic criteria, which are used in the final case classification carried out by the local data collection centre.

Sources for tracing suspect cases of AMI and stroke are
- admission and discharge reports of the hospitals
- death certificates
- laboratory files
- medico-legal reports
- interview of the relatives
- health insurance data.

The reason for limiting the registration of AMI to the persons under 65 years is the relative unreliability of data on diagnostic criteria for older persons as well as AMI having less public health importance in the older age. As nearly 75 % of all stroke cases occur in persons older than 65 years, it is not reasonable to limit the registration to the persons under 65 years of age. Therefore stroke events in FINMONICA are registered in persons aged between 25 and 74 years at the time of the attack.

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

The record from used for the continuous death data collection is presented on the next page.

The register records the occurrence of attacks, not persons. Attacks suffered by the same person are linked by the social security number (health insurance code number).

For suspected AMI and stroke cases the baseline information is recorded on the form as soon as possible. The follow-up part of the record form is filled in after the patient has deceased after he/she is discharged from the hospital or after not later than 28 day follow-up period. If the patient deceases during this 28-day period those parts of the form for giving information of death will also be completed.

The data on 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 the WHO criteria. The coding and application of the criteria as well as the classification of the cases are carried out in a unified way by one register doctor in each local monitoring area (Joensuu, Kuopio, Turku, Loimaa.)

The diagnostic classification used should eliminate the "false positive" cases. By collecting and validating data as recommended on a number of cases clinically defined as having no AMI most of the "false negative" cases will also be registered.

The register can not detect the so-called "silent AMIs" 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 aim of the FINMONICA study is to eliminate this problem by keeping recording practices unchanged throughout the study period and by observing changes in health practices and medical care services.

TABLE 10.   RECORD FORM FOR COLLECTING DEATH CERTIFICATE DATA

Area (circle)   1. Turku
2. Loimaa
3. North Karelia
4. Kuopio

Date on all deaths occurred for the residents of the registration area
between .198 - .198

Personal identification code	Date of death						Cause of death (ICD code)		Name
D D M M Y Y	D	D	M	M	Y	Y	Direct (1a)	Underlying antecedent cause (1c)	
					9	9	9 9 9 9	9 9 9 9	
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									
20									

The AMI register record form contains information on the following groups of variables:
- demographic factors
- site of treatment
- former occupation, smoking, blood pressure and previous AMI history
- history of the attack
- coronary events during hospital treatment
- the status at 28 days' follow-up
- diagnostic criteria and diagnostic classification
- weight, height, serum cholesterol, serum enzymes
- data related to death within 28 days.

Each registered case of suspected 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 resuscitation not fulfilling criteria for definite or possible AMI
4. no AMI or coronary death
5. fatal cases with insufficient data.

There is a separate detailed register manual on the criteria used and the general day - to -day operation of the AMI register.

The stroke register contains the following variables:
- demographic factors
- site of treatment
- previous residency, work ability, history of hypertension, AMI and stroke
- history of the attack and its beginning
- diagnostic examinations
- rehabilitation
- the status at 28-days' follow-up
- clinical diagnosis and diagnostic classification
- data related to death within 28 days

The registration of stroke events is based on clinical diagnosis: cases with a clinical diagnosis 'suspected stroke' (ICD code 430-438) are primarily evaluated. The definition of stroke is: 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 apparent than vascular 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 ICD (8th rev.) 430-434 or 436. There is also a separate detailed register manual on the diagnostic criteria and day -to - day operation of the stroke register.

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

4.2. Monitoring of CVD risk factors and other related factors

At the beginning of the project period (1982), in the middle of it (1987) and at the end of the study (1992), cross-sectional surveys of random population samples are carried out to measure the risk factor levels of the population and to collect other relevant information. These studies apply to the population 25-64 years of age residing permanently in the monitoring area (both males and females).

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 (see 3,3) are regarded as one monitoring area. In this way a sample of about 12 000 persons altogether are taken for each risk factor survey. The sampling is done randomly but stratified according to sex, 10-year age group and monitoring area (North Karelia, Kuopio County and Turku - Loimaa region) and carried out by computer from the national population register.

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

The variable groups to be measured in the risk factor survey include:
- smoking (and serum thiocyanate)
- blood pressure and antihypertensive treatment
- dietary habits and alcohol consumption (plus serum gamma-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
- experienced symptoms and subjective health (e.g. symptoms of AMI, diabetes)
- use of health services and certain pharmaceuticals (including contraceptive pills)
- sodium, potassium and creatinine in a 24-hour urine (in a subsample)
- 3-day food consumption diary (in a subsample).

The field studies are carried out by four trained survey teams being comprised of nurses. The survey teams rotate between the monitoring areas. The persons to be examined are invited to fill in the questionnaire before the examination at home. At the site of examination the questionnaires are checked up and supplementary interviews carried out. Blood samples are taken and physical measurements performed. About 50 persons are examined within one day. Thus the field study lasts about three months. In each of the monitoring areas, the field studies are carried out at the same time in winter and early spring.

The questions in the questionnaire are based on recommendations of the WHO, as well as on the previous experiences from the North Karelia project and other studies. Blood pressure is measured by ordinary sphygmomanometer 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). A venous blood sample is taken in a semifasting situation and the centrifuged serum specimens are analyzed in one central laboratory (the Department of Biochemistry of the National Public Health Institute).

The analyses are carried out 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 of the risk factor surveys. Special attention is paid to the standardization of methods, to the training of research assistants and to continuos quality control. Corrective measures are applied when necessary.

Annual postal surveys are made to monitor the health behaviour, use of health services, socio-economic living conditions, and subjective health of the population. These postal surveys are used as supplementary information to the actual risk factor field survey and are carried out by the National Public Health Institute. They cover every year both the whole country (sample approx. 5000) and North Karelia (sample approx. 1200) as well as other monitoring areas.

Data are collected on the use of health services , too, as described. For this, postal and field surveys are used, as well as other available data. Furthermore, additional data are collected on drug consumption and on drug prescription habits in the monitoring areas.

A cumulative blood pressure register was started in North Karelia in 1972 as one part of the North Karelia project. This register will continue its operation in this monitoring area. Data are collected on all persons having blood pressure above the limits set or persons having antihypertensive medication. The registered subjects are annually followed-up especially concerning their blood pressure and status of treatment.

5. PROJECT ORGANIZATION, TIME-TABLE AND RESOURCES

5.1. Organization

The characteristics 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 the central and local levels of administration. 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 institute responsible for the project is the National Public Health Institute (Department of Epidemiology). The project has an advisory group, a director (principal investigator) and a steering committee. The advisory group includes representatives of the National Board of Health, other national experts and representatives of the National Public Health Institute. The steering committee consists of the persons actually in charge of the project at the Institute. The project implementation entails a division into subprojects, each with its own project group. These subdivisions are for the AMI and stroke registers, and for the monitoring of the risk factors and related factors. Additional study groups exist.
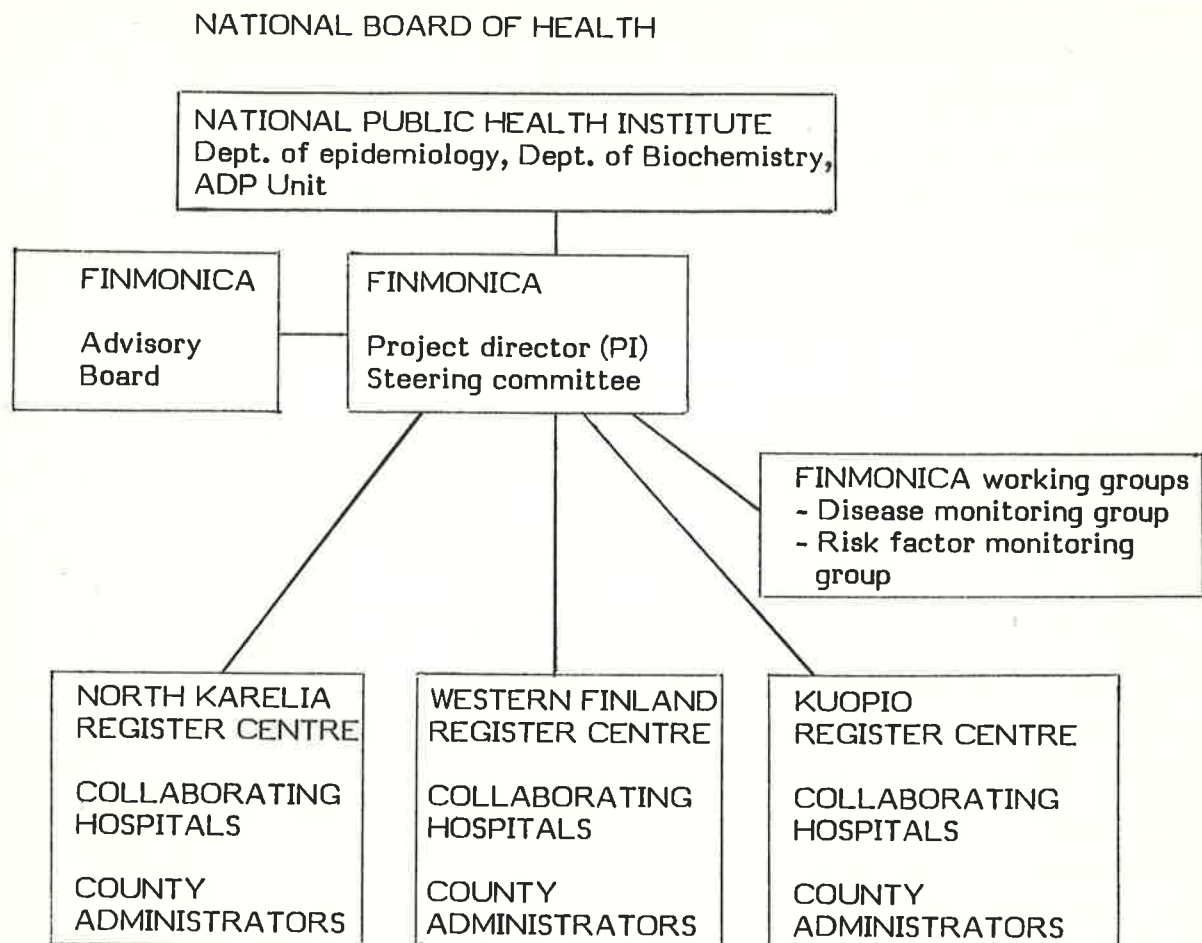
NATIONAL BOARD OF HEALTH

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┌─────────────────────────────────────────────┐
│ NATIONAL PUBLIC HEALTH INSTITUTE             │
│ Dept. of epidemiology, Dept. of Biochemistry,│
│ ADP Unit                                     │
└─────────────────────────────────────────────┘

┌──────────────┐      ┌──────────────────────┐
│ FINMONICA    │      │ FINMONICA            │
│              │──────│                      │
│ Advisory     │      │ Project director (PI)│
│ Board        │      │ Steering committee   │
└──────────────┘      └──────────────────────┘
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FINMONICA working groups
- Disease monitoring group
- Risk factor monitoring
  group

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┌────────────────┐ ┌────────────────┐ ┌────────────────┐
│ NORTH KARELIA  │ │ WESTERN FINLAND│ │ KUOPIO         │
│ REGISTER CENTRE│ │ REGISTER CENTRE│ │ REGISTER CENTRE│
│                │ │                │ │                │
│ COLLABORATING  │ │ COLLABORATING  │ │ COLLABORATING  │
│ HOSPITALS      │ │ HOSPITALS      │ │ HOSPITALS      │
│                │ │                │ │                │
│ COUNTY         │ │ COUNTY         │ │ COUNTY         │
│ ADMINISTRATORS │ │ ADMINISTRATORS │ │ ADMINISTRATORS │
└────────────────┘ └────────────────┘ └────────────────┘
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FIGURE 5. THE ORGANIZATION OF FINMONICA

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

The central data processing of the project 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 hospitals and county administrations.

Risk factor measurements every five years require 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 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 of outside reference laboratories including the Prague reference center.

5.2. Time-table

The planning of the project was begun in the beginning of 1980. During 1980 the protocol draft was prepared and previous data from disease registers in North Karelia were used for planning the operation of the disease registers.

The registering of AMI and stroke cases was started from the beginning of 1981 in Loimaa as was the registering of stroke cases in Turku. The registering of AMIs was continued in Turku as well as the registering of AMI and stroke cases in the area of the North Karelia Central Hospital. Registering practices and criteria were hold as uniform as possible. The methods and the coordination were developed during this preparatory stage. From the beginning of 1982 the methods and criteria in accordance with the WHO protocol were adopted and the FINMONICA was formal started. The adopted methods will be continued without change throughout the whole project period.

The year 1981 was considered as a pilot period for disease registration in the North Karelia and Turku - Loimaa area. The third area in Finland, Kuopio county joined with the project at a later stage. The registration of AMI was started there on 1 November, 1982 and the registration of stroke cases in the beginning of 1983. Since the beginning the disease registers in Kuopio have used exactly the same data collecting methods and diagnostic criteria as used in the other Finnish centres. Long-lasting cooperation with the North Karelia project and experience in epidemiological studies at the Kuopio University Central Hospital make it probable that uniform level of AMI and stroke registration could be achieved. All three AMI and stroke registers will operate up to the end of 1992.

In the spring of 1981 preparations were started for the 1982 risk factor field survey. In the final plan of the survey the protocol adopted by the WHO meeting in October 1981 was taken into account. The two remaining risk factor surveys will be carried out in 1987 and 1992.

The annual postal surveys on health behaviour and related health practices will be carried out annually throughout the project period, at least in North Karelia.

5.3. Project resources

The study expenses consist of the 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 normal duties. Research workers from outside of the Institute, from other institutions, will be working in the project too.

Part of the project costs will be covered by the participating institutions. Such costs include:

1. Data collection for the registers and diagnostic classification of diseases carried out by local health care authorities in Turku, Loimaa, North Karelia and Kuopio

2. Annual postal surveys on the health behaviour of the adult population, carried out by the Department of Epidemiology of the National Public Health Institute.

3. Laboratory analyses of the risk factor measurements carried out in the Department of Biochemistry of the National Public Health Institute.

4. Examination facilities and assistance of the area health centres for the risk factor surveys are arranged by local health authorities.

6. DATA PROCESSING AND REPORTING

Completed record forms from the disease registers are continously sent to the data processing centre of the project located in the National Public Health Institute in Helsinki. After necessary coding and data entry, regular feedback is given to the local registering 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 abnormal laboratory values at the surveys receive their personal laboratory findings as a computer print-out, joined 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 consist of both

1) the differences between the status (incidence rate, prevalence rate) at the outset and the status at the end of the period, and

2) the regression coefficients of the trends (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.

II SURVEY MANUAL

SURVEY MANUAL CONTENTS

1. AIMS
2. GENERAL SURVEY DESIGN
3. SURVEY SITES
4. SURVEY PERSONNEL
5. TIME-SCHEDULE
6. ARRANGEMENT OF THE SURVEY PREMISES
7. IMPLEMENTATION OF THE FIELD WORK
8. THE QUESTIONNAIRE
9. LABORATORY ANALYSES
10. ADMINISTRATIVE ASPECTS

1. AIMS

The main purpose of the survey carried out in 1982 in East and South West Finland was 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 was 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

According to the general project protocol the city of Turku and the rural municipalities around the Loimaa district hospital were chosen as target areas in South West Finland. In eastern Finland the counties of North Karelia and Kuopio were chosen. In these two counties the survey was carried out in all municipalities.

The survey consists of the adult population in these monitoring areas. A sample of 4000 persons 25-64 years of age was chosen from each of the three areas by systematic random sampling, stratified by age and sex, from the national population register. The sample presented the situation in October 1981. The total sample from all three areas thus was 12 000 persons and the sample size in each sex and 10-year age group was about 500. In 1982 there were additional samples of approximately 200 persons aged 15 to 24 from North Karelia and Kuopio counties. The total number of persons invited to participate in the survey thus was 12 400.

Persons who have permanently moved out of the survey area and deceased persons, thus not 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 their municipality registered as indicated by the sampling list used. Persons who have recently moved from one study area to another and thus are not living in the area to be sampled are not included in the basic population of the survey.

3. SURVEY SITES

The survey field actitivities are carried out mainly in the health centres of each municipality or on some 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 rented facilities in the centre of the city will be used. In municipalities with two or more centres located far from each other the survey will be arranged in each of them. Health boards are requested to reserve one spacious waiting and reception room and three other examination rooms for survey purposes.

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 survey nurses, four laboratory nurses and four auxiliary nurses are hired for the field study. These are grouped into four study groups, each comprising of one nurse, one laboratory nurse and one auxiliary nurse. In 1982, one additional laboratory nurse carried out a special additional study on C- and E-vitamins related to the survey.

The public health nurse is acting as co-ordinator of the field work and when necessary, as the in-reserve person for the groups.

The survey nurse is acting as leader of her survey group and as liaison with the survey centres. She wil give instructions on urine samples or food diary to persons belonging to subsamples and is checking the questionnaires. This person also acts as person in reserve for the laboratory nurse taking blood samples.

The laboratory nurse takes the venous blood samples and takes care of their handling and mailing. She is also in charge of the handling and mailing of the urine samples. She also is the in-reserve person for the auxiliary nurse measuring blood pressures.

The auxiliary nurse measures blood pressures and pulse 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 include preliminary preparations on the survey site and the reception of subjects invited to the survey, measurement of height and weight and local inquiries on the non-respondents of the survey.

5. TIME-SCHEDULE

The survey personnel were trained in Helsinki at the National Public Health Institute during two weeks before the study. A separate training programme is available.

Field work of the first survey commenced on the 18th of January 1982 and ended on the 2nd of April 1982. Each of the four study groups operated 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 began daily at 11 a.m. and ended between 7 and 8 p.m. Persons to be studied had been invited from 11 a.m. to 3.30 p.m. at a rate of 3 in 15 minutes and from 4 p.m. to 6.45 p.m. at a rate of 1 in 15 minutes. (It was 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 were invited each day. The study was carried out only on working days.

6. ARRANGEMENTS OF THE SURVEY PREMISES

Provision for the necessary facilities: 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 consumption records model forms and instructions for filling out the forms
- 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 sphygmomanometers (for measurement of blood pressure)
- stethoscope with the bell
- tourniquet
- population register stickers
- tube stands
- centrifuge
- packing material (tape, string, etc.)
- questionnaire forms.

7. IMPLEMENTATION OF THE FIELD WORK

7.1. Invitations

The questionnare is sent to the sample subjects by mail as well as an invitation to the examination. The letter is mailed 10 days before the examination day. The invitation describes the purpose of the study as well as the location, date and time of the examination.

The invitations and questionnaires are sent from the National Public Health Institute in Helsinki. The survey groups receive lists with the names of the invited persons. The names are listed by municipality in alphabetical order. The subjects are invited to the examination in this same order. 67 persons are invited daily 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 in 15 minutes and from 4 p.m. to 6.45 p.m. one person in 15 minutes are invited. In addition to this, in Joensuu, Kuopio and Turku one additional person to these is called every hour.

The persons to be examined may change the time allotted to them by contacting a telephone number (of the National Public Health Institute) given in the invitation letter. A new time is given, primarily for the same day as the original. If this is not possible, a new time is given in Joensuu, Kuopio and Turku usually for the last study week and in other localities for the last day of the study period. If necessary a new time can also be given:
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 in the morning of each dayof study. The centre wil give the names of persons invited to the survey that day (first and last names on the list as well as changes) in alphabetical order.

In Joensuu, Kuopio and Turku a new invitation and questionnaire will be sent to non-responding persons. The participation of those persons is kindly requested in this new invitation mailed from the survey centre. The new examination times are given for the last week of study period.

At other localities the local assistant joined with the rest of the survey team will check the list of invited persons at the end of each day and wil invite the persons who didn't show up by phone . The new time is usually allotted 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 for non-participation. This reason will be written on the sample list. If there is only one survey day at the locality, no reinvitation can be made. 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 it with him or her to the survey site. In the actual survey situation the following activities take place in the following order:

1. The local assistant
- receives the participant
- marks the arrival on the sample list
- looks through the questionnaire
- marks down those subjects belonging to the subsamples
- is handing out 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
- is taking care of the reinvitations by phone
- will mail the serum and urine samples

2. The auxiliary nurse
- carries out the interview concerning the amount and type of fat on the bread
- will take the blood pressures
- will take the pulse

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

4. The nurse
- is checking, and completing if necessary, the questionnaire form
- will give instructions to those belonging to the respective subsample for the collection of 24 h urine sample
- will give further instructions to those in the nutrition subsample and filling out the food consumption record
- is checking that all measurements have been taken and samples obtained.

Thus the participant goes 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 syrvey participant is received by the local assistant. The local assistant will receive instructions beforehand on his/her duties, and in the morning of each survey day, at each locality, the group nurse will give practical instructions on the tasks to be executed.

If no local assistant is available the survey centre will recruit someone to perform these tasks. If however, two groups are operating at the same time in the locality and no local assistant is available the public health nurse or one of the two laboratory nurses will act as assistant while the other laboratory nurse is taking the venous blood samples and is taking care of their handling for both groups.

The local assistant:
- receives the subject, checks his/her identity and address, and signs the person as arrived in the sample list
- writes down 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 will give instructions on how to fill in missing parts

- will give 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 the not-attending persons and makes an attempt to contact them in order to attend on some of the following days or writes down reason for non-participation

- is also acting as liaison with the local health centre (eg. organisation of blood pressure control, contacts with the laboratory, medical problems etc.)

In practice the following is carried out:

1. The participant is signed to be 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. Address changes are corrected but changes must not be made in 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 social security code number (available from the list) is carefully written on the form under the sticker. After this the person's date of birth is checked and those belonging to subsamples are marked (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 1 st and the 6th day (both of these days included) of any month

- blue for the subsample who will keep a three day food consumption record: born between the 7th and the 12th day (including both of these)

- green for blood pressure control measurement subsample: born on the 14 th and 15th day of any month (in 1982 survey).

The above comprises only of people aged 25-64 years. All people younger than that (subjects of the additional samples in North Karelia and Kuopio counties) are also marked yellow (disregarding their date of birth).

3. Height and weight:

The survey group brings a height measuring stick with it to the survey site. 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 using local counter-weight scales to the nearest 0,1 kg. Before the use the scales are to be calibrated. The subject must have only light dressing (ie. no outer clothing, like jackets, sweaters etc.).

4. Looking through the form:

The receiving person looks through the form. If there are unfilled parts, the person is requested to supply these 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 corresponding 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 assisted by the study group checks on non-participants. As the high participation rate is of importance the local assistant attempts to contact absentees and makes a request for them to participate on some of the remaining survey days. If the reason for not coming is known, it is written in the right-hand margin of the list, eg. "deceased", "moved abroad", "mentally disabled", "refused", etc.

In distinct situations the local assistant contacts the survey group nurse who further contacts the 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 done by the auxiliary nurse as the blood pressure is measured:

- the participant arrives and sits down
- the cuff is placed on the right arm
- the participant is interviewed on the amount and type of bread fat used
- the date and time of measurement is marked on the form
- the first blood pressure measurement is carried out
- the blood pressure value is marked both on the back page of the questionnaire form and on

  the day record list
- the pulse is measured
- the second blood pressure measurement is performed
- the results of the measurements 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) after waiting for 30 seconds This
  was done only in the 1982 survey.

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 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 sliced 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 bread and butter have been bought by the groups during the morning. The auxiliary nurse is asking the subject the following questions:

1. How many pieces of bread (different kinds) a day do you eat on the average?
2. What kind of fat do you use on bread?
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 sphygmomanometer. Measurement is always carried out in a sitting position. The examinee sits on the chair after which the cuff is placed on his right arm. The size of the cuff is 13 x 40 cm. It is tightly winded around the arm without, however, exerting too much pressure. On the side of the armpit the indexfinger 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 so that space remains for the stethoscope. After the cuff is placed, the participant sits on the chair and is interviewed on bread fat type and amount, as stated above.

The survey date and exact time of measurement are marked on the back page of the form. The last full hour is marked as the time of measurement, eg. 4.45 p.m. = 4 p.m. The room temperature is recorded using Celsius Scale, eg. 18ºC (in 1987 and 1992 surveys).

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. The slightest pronation can cause the biceps tendon to press against the artery and thus cause biased measurements. After the cuff is inflated the radial artery is palpated with the finger-tips. The cuff is rapidly inflated to about 30mm-Hg 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 additional and confusing sounds.

The pressure in the cuff is steadily released so that the mercury column is sinking 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 value is the level where the first sounds identifiable as heartbeats can be heard. Diastolic blood pressure value is the point where pulse sounds cease (fifth phase). Participants with fifth phase diastolic blood pressure reading as "zero" are re-measured and the fourth phase, or weakening of sounds, is used as the diastolic blood pressure value. In these (rare) cases a marking of 0 is made on the back page of the questionnaire form in the respective place.

When the measurement is performed it is important that the arm is approximately at the heart level (at the level of the fourth intercostal at an angle of 0 - 40º to the body). The readings for systolic and diastolic blood pressures are taken by 2 mm (only even numbers). The manometer must be at the eye-level of the measuring person during the measurement.

After measuring 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 the date and the code of the measurement performed- is sent daily to the survey centre for continuous quality control.

After the first measurement, the cuff valve will be completely opened but the cuff is

left on the arm. The pulse will then be 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 blood pressure measurement is carried out in the same way as the first one.

Persons born on the 14th and 15th days of any month were also subjected to a third and a fourth measurement (in the 1982 survey). An additional measurement was also carried out in 1982 in Kuopio by outside investigators having an automatic sphygmomano- meter and a random zero manometer (for further quality control).

The blood pressure readings are told to the participant, too. If the diastolic pressure is higher than 95 mmHg in a person under 40 years, and 100 mmHg or higher in a person of 40 years 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 requested to have another measurement at the hypertension out-patient clinic or by the public health nurse of the local health centre. If the diastolic blood pressure is 120 mmHg or higher the person is urged to have an immediate appointment with a doctor. The local assistant will help with these arrangements.

3. Blood pressure control measurements in 1982

Persons born on the 14th and 15th day of any month were subjected to a third and a fourth blood pressure measurement. One of these was done with a short cuff (13 x 24 cm), the other using a conventional long cuff (13 x 40 cm). Each survey group had two blood pressure manometers, with a short cuff in one of them. Participants having "green" subsample had their blood pressure measured twice as stated above. After this, participants born on the 14th day of the month were measured using the same methods, first a short cuff and then a long cuff. The measurements for persons born on the 15th day were made in reverse order. First with the long cuff and then with the short cuff. The results of the third and fourth measurements were marked on the back page of the form.

In Kuopio blood pressure was measured with an automatic blood pressure manometer and a random zero manometer in addition to the measurements described above. The measurements were conducted after the actual survey with special arrangements.

7.5. Venous blood sample

Two 10 ml sample tubes 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 the

tourniquet is placed around the arm. The skin is cleansed with isopropyl alcohol preparation. The tourniquet is opened immediately after the needle has entered the vein.

The sample tube is marked immediately with a sticker (name, identification number). The tubes are kept in a standing position at the room temperature for half an hour and are then placed in a refrigerator (+ 4°C).

The tubes are centrifuged in several batches during the day using the speed of 3000 rpm for 10-15 minutes. The centrifuged serum is separated into the transport tubes by pouring or by pipette. One to 1,5 ml is separated into the smaller transport tube and the rest of both tubes poured into the larger transport tube. The transport tubes are marked by writing the observation code (eg. 01234), name of the participant and study date (eg. 01.02.82) on the sticker. The main serum sample is sent to the National Public Health Institute in Helsinki for cholesterol, HDL-cholesterol, thiocyanate and gamma-GT determination. The other one was sent to the University of Tampere where the linoleic acid content of cholesterol ester fraction was determined only (in the 1982 survey). All persons with a serum cholesterol $\geq$ 7,5 mmol/l are later informed of this by mail.

In the examination place the serum tubes are packed in specially designed styrox boxes where the smaller and larger tubes are 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. A form with data on quality, number of sample tubes, place of mailing and sample date is included with every package. Thus the serum samples are sent fresh and are analyzed immediately after arrival in Helsinki as described later (within 2-5 days).

7.6. Questionnaire checking and control inquiry on smoking

The questionnaire is checked through and all the unanswered or indistinct parts are filled in by the nurse. Special attention is paid to important questions (explained during training). The forms with shipping lists 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" means at least once a day for at least one year) and whether he/she has been smoking during the last month. The answer is then marked in the questionnaire space designated "control"; 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 of pipefuls smoked daily is recorded. For these participants the inquiry is carried out before the nurse goes through the questionnaire and the self-written reports on smoking are not changed.

7.7. Collection of 24 hour urine sample

Persons born on the 1st to 6th days of any calendar month as well as 14 to 24-year-old persons in the Kuopio and North Karelia counties ("yellow" subsample) are requested 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 hour urine. The collection is then carried out, usually on the next Sunday. In some cases the collection can 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 receptacle with a sticker on the lid in which the name and collection date, time of beginning, end of collection, and the amount lost are marked. Collection is begun in the morning, since the time is marked on the sticker and will be continued for a period of 24 hours.

The urine samples will be received at the local health centre laboratory with the exception of Joensuu, Kuopio and Turku. The laboratory receives the sample is, mixing and measuring it and separates a 5 ml sample. The urine samples are marked in a list having the name of the study person, his/her social security code number, and identification number, collection date and total amount of the urine. The amount should be marked to the nearest 10 ml. The sample tube is left slightly less than filled. The tube is tightly closed and a sticker is placed on it having the observation code of the study person, name and collection date. The rest of the urine is disposed of and the receptacle 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 is in charge of the samples. The subjects return the urine samples on Monday beginning at 7.00 a.m. Empty cleaned receptacles 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 in advance from the survey centre to the localities.

All persons returning their urine samples are informed by letter of their urine and blood analysis results.

7.8. Food consumption record

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

The keeping of the food record is begun on the morning following the study day. The completed forms 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. The 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 principles commonly used internationally. The questionnaire is printed. Subjects whose native language is Swedish (a small minority) receive the Swedish version of the questionnaire all the others are presented in Finnish.

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 with them to the examination site where 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 site. Subjects belonging to a subsample ("yellow") complete a separate health knowledge questionnaire at the examination site. Subjects of another subsample ("blue") keep a food consumption record for three days after the examination and mail it to the survey centre.

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

Physical measurements

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

Smoking

- Smoking status (61, 62, 63, 64)
- Smoking habits (65, 66)
- Quitting of smoking (67, 68, 69, 70)
- Advice received to stop smoking (71, 72)

Dietary habits

- Fat: type of fat used in food preparation (74, 75)

    type and amount of milk (79, 80)

    type and amount of fat used on bread (backpage 4, 5, 6)

    milk or cream used in coffee or tea (76, 78)

    eating visible meat fat(81)
- Sugar: with coffee or tea (76, 77)

    soft drinks, sweets (85, 86)
- Eggs (82)
- Salt: salting habits (88, 89)

    salt taste level (90, 91, 92)

    salty food stuffs (95)

    advice received to reduce salt intake (93, 94)
- Alcohol (87)
- Vegetables, fruit and berries (83, 84)
- Meal pattern (73)
- Observed dietary changes (96)

Composition of the diet

- 3 day food consumption record (subsample)

Weight

(- Weight, height)
- Weight change (97)
- Attempts to change weight (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

- Visits to the doctor or to the public health nurse (12, 13)
- Participation in health examinations (22)
- Participated in health education meetings (99), see also (71, 72, 93, 94)
- Cholesterol screening (23, 24)
- Hypertension screening (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)

Family history

- Paternal(32)
- Maternal(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-demand, aggressiveness, time urgency (120, 122, 123)
- Concegling of feelings (119, 121)
- Use of relaxation techniques (60)

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

The questionnaire is attached to this manual as an appendix.

9. LABORATORY ANALYSES

The following analyses and methods were used in the survey of 1982. The aim is to repeat the procedures in 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 beginning 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 absorbance of the standards is noted and if 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 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.[2] with AutoAnalyzer 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[3] using the reagents from Baker Chemicals B.V.

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

2) Butts, W., Kuehneman, M. and Graham M. Widowson. Clin Chem 1974, 20: 1344-1348

3) Scandinavian Committee on Enzymes. Scand J.Clin Lab.Invest. 1976:36: 119-125

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 approved the project and partly funds the survey. The health boards of the municipalities receive a letter from the National Public Health Institute and the National Board of Health requesting their approval of the implementation plan for the survey in the areas concerned.

The additional survey personnel for the survey groups are hired by the National Public Health Institute for the whole study period; in 1982 this was due from Janurary 4th to April 3rd. The nurses receive a fixed monthly salary with no extra payments. 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 financial 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 from the National Public Health Institute. Telephone calls from the survey sites to the National Public Health Institute can be made collect or the phone bill can be sent to the Institute.

Within the National Public Health Institute the Department of Epidemiology is responsible for the whole MONICA project as well as for the field surveys 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 answering questions related to the survey.

III ACUTE MYOCARDIAL INFARCTION
AND STROKE REGISTER MANUAL

CONTENTS

1. AMI REGISTER

1. 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 suspected acute myocardial infarction (AMI) occuring among the people below 65 years of age permanently living in the monitoring areas. For every case, information is collected using standardized procedures and special record forms.

2. Sources of information

Normally-wise, a case is found when the patient comes to a hospital or health centre with symptoms refessing to a coronary attack. All such patients in the monitoring areas should be admitted to the hospital ward or to the health centre (in most instances, this is the case in Finland). The local monitoring centre ensures that all record forms are systematically completed in every such institution in the area (usually done by the local register nurse).

Death certificates consist of another major source of information. These certificates are checked-up and photo-copied by the register nurse in Joensuu, Kuopio, Turku and Loimaa at least once a month. All such certificates are carefully reviewed which show that the deceased person was less than 65 years of age, that he/she was resident of the monitoring area, and that his/her cause of death is belonging to one of the following categories (ICD-8):
- hypertension 401-405
- ischaemic heart disease 410-414
- other heart disease 420-429
- atherosclerosis 440-447.

The 8th Revision of International Classification of Diseases is used (to the end of 1986).

The death certificates are also reviewed by the register doctor of the monitoring area according to the diagnostic criteria presented below.

In addition to the above-mentioned sources of information, possibly missed cases of AMI are sought for in the in-patient discharge records of the local hospitals and health centres. Missed cases can also occasionally be detected from laboratory reports (cardiac enzymes) or autopsy reports. If the resident of the monitoring area has a heart attack and is treated at some hospital outside the monitoring area the hospital where the patient is treated usually sends the patient records to the local hospital for follow-up. This practice enables the registration of these cases.

3. Diagnostic criteria

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

The register nurse interviews the patient on pain and other symptoms: If this is not possible the respective information is obtained from patient files. It should be not that case finding can initially be due to other reasons than pain.

The ECG is recorded from all suspect cases on their arrival and during first, second and third days of hospitalization as well as before discharge. During the recording the paper speed should be 50 mm per second. All ECG readings or their copies are submitted to the local monitoring centre for diagnostic classification. The classification and the protocol criteria on which the classification is based are recorded on the record form. The localisation of the myocardial infarction is also coded according to the following instructions

1) anterior (V1 - V5)
2) lateral (I, aVL, V6)
3) inferior (II, III, aVF)
4) 1 + 2
5) 2 + 3
6) other combination

The enzyme pattern is analyzed primarily serum CK (creatine kinase) enzyme and its MB fraction or LD (lactic dehydrogenase) with its isoenzymes, or SGOT (aspartate aminotransferase) come into question.

To be able to fully evaluate the enzyme results the onset of pain should be determined as exactly as possible. Each enzyme has its own typical pattern in AMI; the schedule for blood sampling should be determined accordingly.

Every monitoring centre is using enzyme determinations according to the local circumstances. The blood sampling schedule and the reference values used are presented below: the MONICA protocol is followed.

It is recommended that the autopsy rate should be as high as possible for fatal cases with suspected CHD and that special attention should be paid to the coronary vessels at the autopsy. The necropsy findings are made available for the monitoring centre to enable the diagnostic classification. The criteria proposed by the MONICA protocol are presented below.

Based on the information presented above each monitoring centre (Joensuu for North Karelia, Turku and Loimaa for South-West Finland area and Kuopio for Kuopio county) is coding the diagnostic criteria. These codes are written down in the record forms in the appropriate places. The criteria proposed by the MONICA protocol are used in Finland and 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 pain for more than 20 minutes AND

(ii) no definite non-cardiac cause.

Note: Other characteristics are clinically used but as these are not always present they cannot be used in the definition.

If the duration of pain can not be determined in minutes or hours but it is implied that the duration has been long (the subject is using terms like prolonged or continuous pain, or the pain was present until death, summoning of help, advent of medical care or injection of analgesic) took place the pain can be coded as typical.

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.

Note: The pain should be recorded as atypical if it is of short duration, intermittent with each bout lasting for less than 20 minutes, or appearing at an unusual site (upper abdomen, arms, jaw, neck).

Fatal collapse should not be considered as syncope, otherwise all sudden deaths would be coded in this way. Syncope should be reversible. Typical chest pain leading to syncope should not be coded as an atypical symptom.

1.3 Other

Symptoms not satisfying criteria for Typical, Atypical or Inadequately described.

1.4 None

Complete absence of symptoms in the attack (eg sudden death)

1.5 Inadequately described

Cases otherwise satisfying criteria for Typical pain but in which the duration of the pain is not described to enable the classification of the symptom as Typical or Atypical.

1.9 Not known

No information on whether symptoms were present.

For diagnostic classification purposes, code 2 is equivalent to code 5; and codes 3, 4 and 9 are equivalent to each other (see the record form).

(2.) Electrocardiogram

The ECG diagnostic classification is based on the electrocardiograms recorded after the acute attack and if available ECGs recorded immediately before the attack (i.e. within the previous 28 days). Up to four ECG records should be selected for coding and the selection process should be standardized, as requested:

1)   First ECG available after the attack (or one from immediately beforehand)

2-3) The next 2 ECGs having different dates from the fist one and from each others

4)   The last available ECG from the patient file

Local discretion can be used if:

One or more ECG records as specified above are uncodeable or are codeable but the ECG records are not available

OR

Acute ischaemic changes occur progressively later during the surveillance period (e.g. late inversion of T waves in the presence of ST elevation).

2.1 Definite ECG

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

(as characterized below)

-AND/OR-

(B) The evolution of an injury current which lasts more than one day.

(as characterized below)

(Note: criterion B is included because diagnostic Q waves already are present in the first ECG recording in many cases. The presence of Q waves is not necessarily needed to satisfy this criterion)

The interpretation of at least two or (sometimes) three ECG records is therefore necessary for the establishment of these categories. (No more than four ECG records should be coded. Four records should be coded if they are available.)

A.   Development of Q waves

Progression of the Q code from no Q to a diagnostic Q is sufficient but the change from no Q to an equivocal Q or from equivocal to diagnostic Q must be accompanied by deterioration in the ST segment or in the T wave. A change in the Q code or in the 4; 5. or 9-2 code must occur within the same lead group but the Q can be in a different lead group from where the 4,- 5- or 9-2 code is being followed. Note that Minnesota code 1-2-6 is equivalent to No Q code.

i)   No Q or QS code in the first 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 (No Minn. code 4-1 or 4-2) in the first 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 (No Minn. code 9-2) in the first 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 (No Minn. code 5-1 or 5-2) in the first 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 in the first ECG 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 in the first ECG 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 in the first ECG followed by a record with an equivocal Q code plus a 5-1 or 5-2

-OR-

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

viii)   An ST segment elevation (Minn. code 9-2) lasting more than one day (i.e. present on consecutive records of different dates)

AND

T wave progression on three or more records from 5-0 to 5-2 or from 5-3 to 5-1, with an abnormal code present on consecutive records of different dates.

Note: The ST segment elevation does not have to be present in the same lead groups as the T progression, nor does it have to be exactly simultaneous. Q waves will often be present in the same graphs but they are not necessarily needed for the application of this criterion for Definite ECG.

2.2 Probable ECG

Evolution of repolarisation changes

i) No major ST segment depression in one ECG record (no 4-1 or 4-2) and another record with a major ST segment depression (Minn. code 4-1)
ii) No ST segment elevation in one ECG record (no 9-2) and another record with an ST segment elevation (Minn. code 9-2)
iii) No major T wave inversion in one ECG record (no 5-1 or 5-2) and another record with a major T wave inversion (Minn. code 5-1 or 5-2)

Note: Unlike the criteria in the previous classes, the evolution in this class can go in either direction, that is the codes can get more or less favorable.
Please, note also that the criteria are not identical to those for repolarisation criteria accompanying the Q classes ii) to vii) in that the 4 code is stricter; the development or disappearance of 4-2 does not satisfy; only 4-1 is satisfactory.

2.3 Ischaemic ECG (in one or more records)

Records not satisfying the above criteria which nonetheless show:
i) Minnesota codes 1-1-1 to 1-3-6 excluding 1-2-6 for Q and QS codes

-AND/ OR-

ii) Minnesota codes 4-1 through 4-3 for ST junction (J) and segment depression.

-AND/ OR-

iii) Minnesota codes 5-1 through 5-3 for T wave items

-AND/ OR-

iv) Minnesota code 9-2 for ST segment elevation.

2.4. Other ECG

All other ECG findings, including normal ECG.
Note rules for uncodable ECG below.

2.5. Uncodable ECG

This classification should be used if all the available ECGs recorded during the attack are uncodable for technical reasons or because of the presence of suppression codes. Records in which suppression codes permit certain Q codes to appear can be used to diagnose the development of a diagnostic Q code from no Q code (MONICA category 2.1A i) or to allocate the code of ischaemic ECG (MONICA category 2.3); supporting evidence from 4, 5, and 9-2 codes are needed for all the other MONICA ECG classes. Therefore, unless
codable Q waves are present leading to the diagnostic or ischaemic category, and unless at least one ECG is available that can be coded for 1, 4, 5, and 9-2 items, the presence of suppression codes or technically unsatisfactory records should lead to the classification "uncodable". The implications of this rule are that ventricular conduction abnormalities and arrythmias occurring in the course of an event are not used as collateral evidence of ischaemia.

The following Minnesota codes lead to suppression of all or most of these items, and a set of ECG records in which such findings are present in every record should be considered uncodable (unless codable Q waves are present, for example an ECG showing a 7-4)

6-1   Third degree A-V block suppresses all 1,- 4,- 5- and 9-2 codes.

6-4-1   Persistent Wolff-Parkinson White ECG pattern suppresses all other codes

6-8   Artificial pacemaker suppresses all other codes

7-1-1   Complete left bundle branch block suppresses 1-2-3, 1-2-7, 1-2-8, 1-3-2, 1-3-6 and all 4,- 5- and 9-2 codes but the presence of a codable Q downgrades it to 7-4.

7-2-1   Complete right bundle branch block suppresses 1-2-8, and all 4,- 5- and 9-2 codes.

7-4   Intraventiricular block suppresses all 4,- 5,- and 9-2 codes

8-2-1   Ventricular fibrillation and asystole suppress all other codes

8-2-2   Idioventricular rhythm suppresses all other codes.

8-4-1   Supraventricular tachycardia in excess of 140/minute suppresses all other codes.

2-6   ECG absent

No ECG available or recorded (Coded as 9, no data)

(3.) Cardiac enzymes

Appropriate serum cardiac enzymes are used in the diagnostic classification. The following general principles are used:

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 limits of normal.

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

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

Normal: Within normal limits.

Following enzymes are used in the diagnosis of AMI in the monitoring areas:

Enzyme	Normal	Equivocal	Abnormal
S-CK	< 200	201-400	> 400
S-CK-MB	< 15	16- 30	> 30
S-LD	< 450	451-900	> 900
S-LD1	< 130	131-260	> 260
S-GOT	< 40	41- 80	> 80

CK   =creatine kinase

CK-MB=creatine kinase MB fraction

LD   =lactic dehydrogenase

LD1   =lactic dehydrogenase isdenzyme

GOT   =aspartate aminotransferase

At the North Karelia Central Hospital following enzymes and schedules are used: S-CK and S-CK-MB on arrival and thereafter 3 more determinations made at about 12 hours' interval. S-LD and S-LD1 defined on the first 2 days of hospitalization.
In the area health centre hospitals GOT and S-CK are used. Two largest health centre hospitals also define CK-MB but the specimens are sent to the central hospital for analysis.

At the Kuopio University Central Hospital the normal schedule is as follows: S-CK and S-CK-MB on arrival and during first 3 days twice daily. S-LD and S-LD1 during the first 4 days. The district hospitals and the health centre hospitals usually analyze S-CK, S-CK-MB, S-LD and S-LD1 on arrival and during first 3 days.

In Turku and in Loimaa S-LD and S-GOT were used until Jan 1, 1985. Since that date enzymes have been analyzed as in Kuopio. In Loimaa S-GOT is determined on arrival and since that 4 times at 6 hours' intervals.

S-LD is determined from the first and fourth specimen. S-GOT and S-LD are also analyzed on the second, third and seventh day of hospitalization.

(4.) Necropsy findings

The results of post-mortem examination are recorded in the following section of the record form and provide data for diagnostic classification as follows:
Definite evidence of acute myocardial infarction: The presence of a recent myocardial infarction and /or recent occlusion of a coronary artery (from antemortem thrombus, haemorrhage in to an atheromatous plaque or embolism).
Note: this is based on the macroscopic inspection of the heart.
Equivocal: Signs of chronic ischaemic heart disease: old myocardial infarction (scar) or occlusion or severe stenosis (more than 50 % reduction of lumen) by atheroma of one or more coronary arteries in the absence of fatal disease in other organs.
Negative: (a) the absence of macroscopic evidence of recent myocardial infarction or recent occlusion of the coronary artery or (b) evidence of fatal disease in other organs in the presence of ischaemic heart disease.

4.   Diagnostic categories

The diagnostic categories include:
(1) definite acute myocardial infarction
(2) possible acute myocardial infarction or coronary death

(3)   ischaemic cardiac arrest with succesful resuscitation not fulfilling the criteria for definite or possible myocardial infarction

(4)   no acute myocardial infarction or coronary death

(5)   fatal cases with insufficient data

When defining the diagnostic category of the case following definitions should strictly be applied. The definitions used for the diagnosis of "definite" and "possible" acute myocardial infarction are not necessarily the same as would be used by the clinicians, but rigid definitions are essential for core event registration in the MONICA study.

(1)   Definite acute myocardial infarction

(a)   Definite ECG or

(b)   Symptoms typical or atypical or inadequately described in association with probable ECG and abnormal enzymes, or

(c)   Symptoms typical and enzymes abnormal with ischaemic or non-codable ECG or ECG not available, or

(d)   Fatal cases, whether sudden death or not, having a recent myocardial infarction in the macroscopie inspection and/or recent coronary occlusion at necropsy.

(2)   Possible acute myocardial infarction or coronary death

(a)   Patients alive: typical symptoms, ECG records and enzyme values do not categorize them as (1) but there is no evidence for another diagnosis for their attack, or

(b)   Fatal cases, whether sudden or not, (not belonging to the category 1) where there is no evidence for another cause of death either, clinically or at autopsy:

(i)   with symptoms typical or atypical or inadequately described; or

(ii)   without typical or atypical or inadequately described symptoms but with evidence of chronic coronary occlusion or stenosis or old myocardial infarction scarsing at necropsy; or

(iii) having a history of chronic ischaemic heart disease such as definite or possible myocardial infarction, or coronary insufficiency or angina pectoris in the absence of significant valvular disease or cardiomyopathy.

NOTE: Competing causes of death should be evaluated carefully.

(3)   Ischaemic cardiac arrest with successful resuscitation not fulfilling criteria for definite or possible myocardial infarction. Spontaneous cardiac arrest due to the presumed primary ventricular fibrillation not provoked by medical intervention, electrocution, drowning or other serious physical insults. The cardiac arrest should not be caused by ischaemic heart disease, and significant valvular disease or cardiomyopathy should not be present.

(4)   No acute myocardial Infarction

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

   (b) Fatal cases, whether sudden death or not, not belonging to the category (1) in which cases another diagnosis has been made (clinically or at autopsy).

   NOTE: Competing causes of death should be evaluated carefully.

(5)   Fatal cases with insufficient data

   Cases with no autopsy, no history of typical or atypical or inadequately described symptoms, no previous history of chronic ischaemic heart disease and no other diagnosis. Living patients should not be classified into this group.

5.   Instructions on how to complete the record forms

The record form is completed for every case of suspected AMI if the subject is resident of the monitoring area and is aged from 25 to 64 years. If the patient has a new attack within 28 days after onset of the previous attack this is not registered as a new case. However, if the subject has a new attack after these 28 days this is registered as a new case. If the patient dies later than 28 days after the onset of the attack (due to someother reason than a new AMI) the case is not registered. (This information is obtained by record linkage from the 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 of the treating hospital or health centre. The initial information is collected without any delay. After the patient is discharged from the hospital or dies -and no later than 28 days after the onset of symptoms - the follow-up part of the form is completed. In the case of death, the respective part of the record form is also completed. That part of the form needed for the coding of diagnostic information is completed later in the monitoring centre of the area. The completed record form is sent in association with the required diagnostic information (see the record form) to the monitoring centre of the area. There the register doctor performs the coding of the diagnostic criteria and completes the diagnostic classification. Finally, the completed record forms are sent to the national monitoring centre in the National Public Health Institute.

6. Follow-up

Since one year has passed from the myocardial infarction a letter is sent to all registered cases who were alive after the first, 28 days follow-up. In the letter, questionnaire is attached. This questionnaire which the persons are requested to complete consists of 18 precoded questions covering health status, return to work, symptoms, smoking, physical activity and rehabilitation of the registered subjects. If the questionnaire is not returned to the monitoring centre it is checked whether the person is still alive or not. If he/she has deceased during the follow-up year the death information is recorded.

2. STROKE REGISTER

1. Background

The stroke register has been in operation in North Karelia ever since 1972 . After a preparatory stage during the year 1981 the stroke register was established in Western Finland in the City of Turku and in the Loimaa region at the beginning of 1982. The third monitoring area, the County of Kuopio, started the registration of stroke cases at the beginning of 1983.

The populations for stroke event registration are the same as for acute myocardial infarction event registration:

1. North Karelia; the monitoring centre at the Department of Neurology, North Karelia Central Hospital
2. Western Finland : two monitoring centres, one at the City Hospital of Turku and the other at the Department of Medicine in the Loimaa District Hospital.
3. Kuopio County; the monitoring centre at the Department of Neurology, Kuopio University Central Hospital.

2. General principles and registration criteria

The aim is to register every death from a cerebrovascular disease or non-fatal event of cerebrovascular stroke occuring in people aged 25-74 years and being permanent residents of the monitoring areas. The registration does not include TIA-attacks (duration of symptoms less than 24 hours) or chronic non-fatal manifestations of cerebrovascular disease.

3. Eligibility and diagnostic criteria

1. The subject must be resident in the monitoring area and aged between 25 and 74 when the event occurred.
2. The event should have its apparent onset within the study period; more than 28 days should have passed from any preceding recorded stroke event in the subject; and the event should not have occured within 28 days after a definite coronary event which takes precedence.
3. The event must satisfy the criteria for cerebrovascular stroke set by the MONICA protocol.
4. The non-fatal event must have been detected and diagnosed within 28 days of onset.

Stroke is defined as rapidly developing clinical signs of local (or global) disturbance of cerebral function, lasting more than 24 hours or leading to death, with no apparent cause other than a vascular origin. This definition includes patients presenting clinical signs and symptoms suggestive of subarachnoid hemorrhage, intracerebral hemorrhage, or cerebral ischemic necrosis. It does not include transient cerebral ischemia. (Global applies to patients having subarachnoid hemorrhage and to some patients in deep coma, but does not include systemic circulatory failure, e.g. circulatory shock, Stokes-Adams syndrome, or hypertensive encephalopathy).

4. Sources of information

In principle the sources of information are the same as for acute myocardial infarction. The most important source of information is the admission diagnosis at the hospital. Almost all cases of acute stroke are treated at hospital in Finland. Every effort is made to cover all hospital admission diagnoses in every hospital treating stroke cases in the monitoring area.

Another source of information is the hospital discharge diagnosis. These are checked regularly and all hospital records having the clinical diagnosis cerebrovascular disorders (ICD-code 430-438;8th rev.) are checked.

All discharge diagnoses from every hospital in the county are filled by computer, by the North Karelia Central Hospital in North Karelia and by the Kuopio University Central Hospital in the Kuopio County. These files are rechecked for unidentified cases.

Finally, the computer file of all hospital discharge diagnoses in Finland having personal identification codes, diagnoses and residencies becomes available after about one year's delay. This enables the detection of even the cases treated outside the monitoring area.

Fatal cases sent to the hospital but dead in the scene are usually registered at the out-patient department of the hospital. Other cases of fatal stroke become registered by their death certificates. In Finland, all death certificates are sent by law to the municipal authorities and from there to the county coroner. This means that also those fatal cases dying outside the monitoring area should be registered by their death certificates. The office of county coroner is sending each month a list of all death certificates having the cause of death ICD 430-438 to the monitoring centre. The other way to get the information needed is that the register nurse visits the county coroner's office checking all the death certificates and photo-copying the

relevant ones. Finally, the national computer file of all the fatal cases with personal identification code, cause of death and residency becomes available after a few years' delay comprising the final check.

5. Operation of the stroke registers

In the North Karelia County stroke patients are treated either at health centre hospitals or at the North Karelia Central Hospital. In Kuopio County the health centre hospitals, two district hospitals in Varkaus and Iisalmi and the University Central Hospital are in charge of the stroke cases. In Turku most cases of stroke are treated at Turku University Central Hospital and to a lesser extent at the Turku City Hospital. Loimaa District Hospital is responsible for the vast majority of stroke cases in that monitoring area.

A liaison nurse is appointed for the health centre hospitals of each of the monitoring areas. The liaison nurses are in charge of the initial registration of stroke cases admitted to the hospital. The first part of the record form (initial information) will be completed by the hospital first admitting the patients. Four-week follow-up information or information on fatal outcome is given by the hospital were the patient is sited during the follow-up or his/her death. After the record form has been completed by the hospital or the health centre it is sent to the monitoring centre of the area.

Most cases of stroke are treated at the central hospitals, city or district hospitals of the area. In Joensuu, Turku, Loimaa and Kuopio - the locations of the monitoring centres - the register nurse is regularly visiting the out-patient departments of the hospitals checking the admission diagnoses. Cases of definite or possible stroke, even cases of susceptible symptoms are registered. The first part of the record form is completed and the patients are followed-up until discharge, their death or until 28 days has passed. At this stage, the record forms are completed for follow-up information. The register nurses are also regularly checking the discharge diagnoses of the hospitals observing ICD-codes 430 -438 to explore the until them unidentified cases. They are also checking monthly all the death certificates of their monitoring area, extracting the available information and completing the record forms if needed.

All completed record forms are sent without any delay to the register doctor of the monitoring area. A copy of patients' medical record and a copy of the autopsy record will be enclosed with the record forms. At the monitoring centre, the register doctor completes items 25 and 26. Finally, the completed records are sent to the national monitoring centre in the National Public Health Institute.

IV   MEDICAL CARE ASSESSMENT FOR ACUTE MYOCARDIAL INFARCTION

1. Introduction

Changes in cardiovascular mortality rates might be related to:
- a change in disease incidence, or
- a change in case fatality, or
- both.

A change in case-fatality could be related to changes either in medical care in the affected population or in the natural history of the disease, or in both. MONICA study is especially concerned in medical care for the acute myocardial infarction. The second main null hypothesis of the MONICA study is, as stated in the Protocol (May 1983 version):

"for the participating centres there is no relationship between

- 10 year trends in case fatality rate (percentage of attacks that are fatal within 28 days)

AND

- 10-year trends in medical care in the attack."

The hypothesis is that the outcome (case fatality, 0) is related to certain biological and demographical factors (confounding factors, C) and medical treatment during the attack (T)

$0=f(C_i, T_j)$, where

0	outcome
C_i	confounding factors
T_j	treatment factors

The purpose of the FINMONICA medical care assessment study is

1. to describe the changes in medical care found within the 6-year period 1986-1991; and

2. to study the association of the case fatality with medical care indicators of acute myocardial infarction treatment.

2. The general study design

Medical care in the acute myocardial infarction and the subsequent rehabilitation and follow-up consist of the essential part secondary and tertiary prevention in cardiovascular diseases. This medical care comprises of (fig 1.)

- medication prior to the attack
- treatment before hospitalization
- treatment and diagnostic procedures during hospitalization
- treatment and diagnostic procedures during the follow-up period.

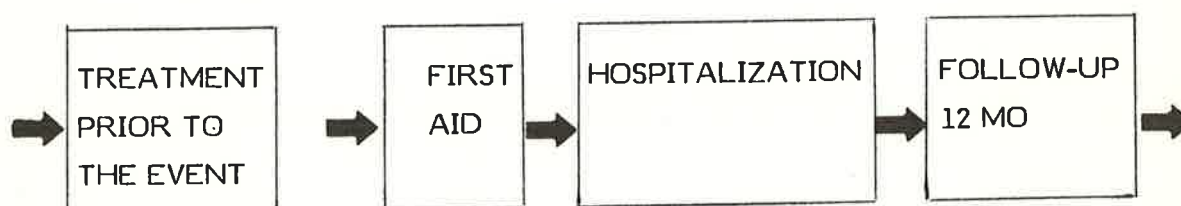| TREATMENT PRIOR TO THE EVENT	FIRST AID	HOSPITALIZATION	FOLLOW-UP 12 MO

Figure 6.   The sequence of diagnostic and therapeutic procedures

The medical care after the acute myocardial infarction is recorded twice in each case: first during the hospitalization and second during the follow-up since one year has passed from the acute attack.

The hospital care data recorded include the measures prior to the event, the the acute care at the hospital and the diagnostic and therapeutic procedures immediately after the discharge. The long-term medical intervention is assessed according to the follow-up information.

Medical care will be monitored two times during the 6 year period : 1986 and 1991.
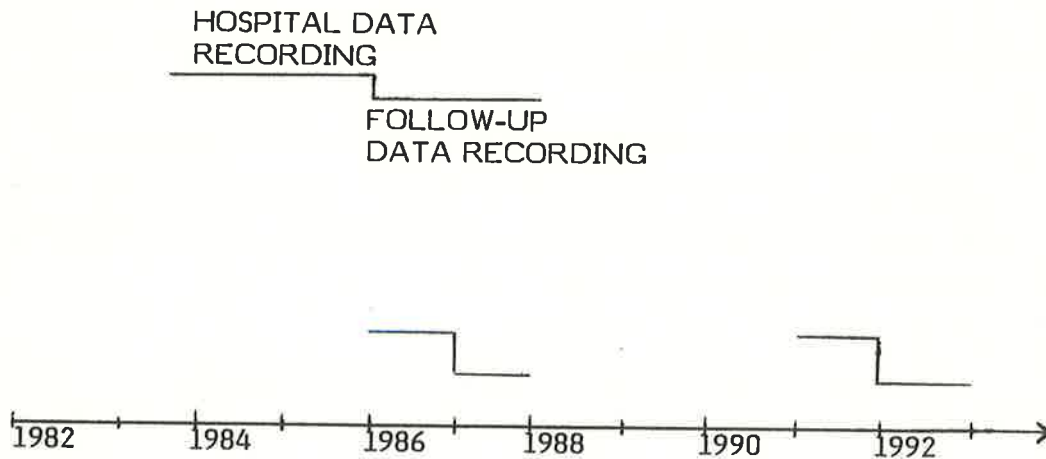

Figure 7. The time-table of the monitoring of AMI medical care.

3. The study material
3.1 Background information

The four FINMONICA acute myocardial infarction registers (South-West Finland consists of two separate AMI registers, Turku and Loimaa) record all suspected AMI cases in their monitoring area. These can be classified as
- sudden deaths (people found dead and resuscitation being unsuccessful),
- deceased during the first 28 days, and
- cases alive after the first 28 days since the attack.

All cases are further classified as definite and possible AMIs, primary ischaemic cardiac arrests and attacks having no AMI. The final diagnosis will be given when all the data concerning the event have been collected.

The total number of registered events in FINMONICA was about 2300 in 1983 (table 11).

Table 11. The number of events in the AMI registers during 1983.

Monitoring area	Both sexes	Men	Women
Kuopio	1000	730	270
North Karelia	800	590	210
Turku	420	320	100
Loimaa	110	80	30
All	2330	1720	610

3.2. The sample size, theoretical considerations

3.2.1 Descriptive analysis

The sample size needed to find a difference between two periods (or types of care) in the utilization rates of pharmaceuticals or procedures is:

$$\beta = 1 - \Phi (\Phi^{-1}(1 - \alpha/2 - d/\sqrt{\sigma^2}) + \Phi (\Phi^{-1} (1 - \alpha/2) - d/\sqrt{\sigma^2})$$

where $\qquad \sigma^2 = \dfrac{a(1-a)}{N_1} + \dfrac{b(1-b)}{N_2}$

Let $N_1 = N_2 = N/2 \geq 25$ and $d \geq 0.05$, then the last term is very small (≤ 0.025) and we can ignore it.

If we assume a significance level $=0,05$, power $=0.80$, then the relationship of $N_1 = N_2 = N/2$ to a and d is as described in table 12.

Table 12. $N_1 = N_2 = N/2$ and its relationship to a and d (d=b-a).

d=	0.10	0.15	0.20	0.30
a=				
0.10	196	98	59	29
0.20	290	137	79	36
0.30	353	160	90	42
0.40	358	171	94	39

The MONICA - protocol (May 1983) suggests a sample size of 500 (N/2=250). This enables us to detect all relevant differences, when $d \geq 0.15$, =0.05 and =0.80, between two populations, in the first study period. It also enables us to detect differences between two periods of time (e.g. the first and second study period), when $d \geq 0.10$.

3.2.2 Analysis of associations between different treatment modalities and case fatality
Under preparation.

3.3. The study material in 1986 study
The medical care during the acute myocardial infarction event will be assessed in all those cases recorded in some of the FINMONICA myocardial infarction registers and have had at least one medical intervention or an attempt of such . Patients with both a successful or an unsuccessful resuscitation and those without cardiac arrest are included. Those patients who are found dead and therefore have had not any medical interventions, are excluded.

The study cases can be definite, possible, or no AMI in their final diagnostic classification. The one year follow-up questionnaire is mailed only to the cases having definite or possible AMI. The information needed can also be recorded during the follow-up visit.

Only male patients will be included in the assessment study. The registration will take place during six months in 1986.

Table 13 shows how the study material is built up.

Table 13.   Estimated number of men in the study material (definite and
            possible cases[1]) according to the status of the patient and the site
            of admission

Men	University Hospitals		North Karelia Central Hospitals	District hospitals	Primary health care centres	Total
	Kuopio	Turku				
Unsuccessful resuscitation	10	10	10	15	35	80
Death during the first 28 days	10	10	10	5	5	40
Alive at 28 days	100	80	100	50	80	410
Total	120	100	120	70	120	530

1) Two third of cases are definite by their diagnostic classification

4. The parameters

4.1. The outcome parameters

- The proportion of cases with any medical intervention during the acute MI
- 28-days case fatality
- one year case fatality

4.2. The determinants

Parameters recorded during the hospitalization:
- treatment prior to the current attack
- delay in starting medical interventions
- cardiac arrest and cardiopulmonary resuscitation outside the hospital
- the total length of stay at the hospital
- the length of time with ECG monitoring
- the intensity of medication at hospital
- the treatment procedures at hospital

- the intensity of diagnostics procedures at hospital
- systematic rehabilitation at hospital
- background and miscellaneous data

Parameters recorded at the time of discharge:
- the prescribed drugs
- planned systematic follow-up and rehabilitation

Parameters recorded at the one year follow-up:
- the number of physician visits
- the attendance to a systematic rehabilitation
- medication and therapeutic procedures performed
- diagnostic procedures performed

5. Data collection

5.1. Data collection, general

Data are collected at two observation points on two separate data forms. The in-hospital data are collected by the register nurses as part of their ordinary work, the event registration. The follow-up data are collected either during patient visits or by mail. The data form therefore has two versions, one to be used at follow-up clinic and the other to be used by mail.

5.2. Data collection, forms

Form 2   Medical care, in-hospital
Form 3A   Medical care, 12 month follow-up, filled in by the nurse
Form 3B   Medical care, 12 month follow-up, mailed to the patient

These forms are under preparation

ANNEXES

SURVEY QUESTIONNAIRE

INSTRUCTIONS FOR THE RESPONDENT

Please give answer to the questions by circling the number corresponding the alternative which is best fitting to you or by writing down what is requested in the respective space. Read the question thoroughly before answering.

Example 1. What is your occupation?

Lumberer

Example 2. What is your marital status?

1 married or married in common-law

2 single

3 separated or divorced

4 widow

If you are married, circle number 1.

Be careful and give your answer to all questions - even negative answers should be marked either by circling the alternative "no" or by marking "0" in the respective space.

Example 3. Have you had any of the following diseases?

	No	Yes	
Rheumatoid arthritis		1	2
Hypertension	1	2	

Example 4. How many days of vacation did you have last year?

0 days

In some questions there are some alternatives given and them a note: "Proceed to question ..." If the given alternatives do not concern you, you can proceed to this question directly and skip the intervening questions.

SURVEY

QUESTIONNAIRE

(as used in the 1982 survey)

1. Sex

    1 male

    2 female

2. Are you

    1 married, or married in common-law

    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 had school altogether or studied full-time in your life?

    _____ years

5. What is your residence on 1.1.1982?

    1 present community

    2 other 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, retired, etc.)?

    1 no

    2 yes, how many? _____

7. Do you have children below the age of 16?

    1 no

    2 yes

8. What is your occupation?

_____

9. In which kind of occupation are you involved for most of the year?
   1 agriculture, farming, forestry
   2 industrial, mining, construction or other similar occupations
   3 office work, service occupation or other similar work
   4 studying
   5 housewife
   6 retired
   7 unemployed

10. In which kind of occupation have you been involved for the longest period in your life?
    1 agriculture, farming, forestry
    2 industrial, mining construction or other similar occupations
    3 office work, service occupation or other similar work
    4 studying
    5 housewife
    6 retired
    7 unemployed

11. What was the total income of your household last year, taxes not exempted?
    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 - 120.000
    8 120.001 - 140.000
    9 more than 140.000

MEDICAL EXAMINATIONS, ILLNESSES

12. How often did you see a doctor last year? (dentists excluded)

_____ times

13. Last year, how often did you go to see a public health nurse or an occupational health nurse or how often did a public health nurse visit you?

_____ times

14. Are you retired because of disability?

1 no

2 yes, partial imbursement

3 yes, for a definite period

4 yes, indefinitely

15. Have you had acute myocardial infarction confirmed by a doctor? (Check if you are not sure)

1 no

2 yes   When was the last time:

year 19_____

Where were you hospitalized?

_____

_____

Did you belong to a rehabilitation group after discharge from the hospital?

1 no

2 yes

16. Have you had stroke, cerebral hemorrhage or cerebral infarction confirmed by a doctor? (Check if you are not sure)

1 no

2 yes, when was the last time:

year 19_____

17. Last year (during the past 12 months), have you 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
Bronchial asthma	1	2
Emphysema, chronic bronchitis	1	2
Gallstones, biliary disease	1	2
Rheumatoid arthritis	1	2
Other musculoskeletal disorders	1	2
Back pain	1	2
Chronic dermatitis	1	2
Chronic pyelonephritis	1	2

18. Do you have diabetes confirmed by a doctor?

    1 no
    2 yes, I receive insulin injections
    3 yes, I receive oral hypoglycemic drugs
    4 yes, only dietary control

19. How many days, during the last year (12 months), were you in sick leave from your work or did not do your daily 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. During the past week (7 days) have you used any

a) prescription drug

    1 no

    2 yes

b) non-prescription drug

    1 no

    2 yes

If you have used any medication during the past week, circle below for which symptom or disease did you use them.

	Pre-scription	Non-pre-scription
Headache	1	2
Joint pain or back-ache	1	2
Other pain	1	2
Common cold, cough or fever	1	2
Restlessness	1	2
Abdominal pain, digestive symptoms or constipation	1	2
Vitamins, stimulants	1	2
Antihypertensive medication	1	2
Cardiac drugs	1	2
Contraceptive pills	1	2
Drugs for skin diseases	1	2
Other medication	1	2

_____

_____

For which symptom:

22. When did you last have a health check-up i.e. a
medical examination not due to symptoms or illness
(e.g., when applying for a job or for a driver's
license, in the material clinic, or health check-up of
the mobile clinic)?
1 during the past 6 months
2 ½ - 1 year ago
3 1 - 5 years ago
4 more than 5 years ago
5 never

23. Has your blood cholesterol ever been measured?
When was the last time?
1 during the past 6 months
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 levels?
1 no
2 yes

25. Has your blood pressure ever been measured? When
was the last time?
1 during the past 6 months
2 ½ - 1 year ago
3 1 - 5 years ago
4 more than 5 years ago
5 never

26. How many times has your blood pressure been
measured during the past year (12 months)?
_____ times

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

28. In which age was your elevated blood pressure first discovered?

_____ years

29. Have you ever used antihypertensive drugs?
   1 no (go 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 $\frac{1}{2}$ year ago
   5 $\frac{1}{2}$ 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? (Choose the most important)
   1 the doctor told me to stop
   2 the public health nurse told me to stop
   3 the medication caused side-effects for me
   4 I don't like to use drugs
   5 the prescription wasn't refilled
   0 I do take antihypertensive drugs at the moment

32. Has your father had, in the age of 60 years or less, 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, in the age of 60 years or less,
    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 your present state of health is? It
    is

    1 very good

    2 reasonably good

    3 medium

    4 not very good

    5 very bad

35. Do you usually cough when first awakened in the
    morning during the winter?

    1 no

    2 yes

36. Do you usually cough during the day or at night
    during the winter?

    1 no

    2 yes

37. Do you cough on most days for as much as three
    months each year?

    1 no

    2 yes

38. During the past month (30 days), have you 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 legs	1	2
Varicose veins	1	2
Constipation	1	2
Repeated digestive symptoms	1	2
Nausea	1	2
Weakening of legs	1	2
Dry mouth	1	2
Stuffy nose	1	2

39. In the following, we shall ask some personal questions. Think of the past month. Please, mention how often the symptom in question has troubled you.

	Often	Some-times	Never
Has your heart rate increased?	3	2	1
Do you get confused when you have to do some work quickly?	3	2	1
Have you trembling in your hands?	3	2	1
Do you feel angry and nervous?	3	2	1
Have you scary thoughts?	3	2	1
Do you feel very tired and over-burdened?	3	2	1
Have you trouble irregular heart-beats?	3	2	1
Do you have dizziness?	3	2	1
Do you have night-mares?	3	2	1
Do you feel depressed?	3	2	1
Do you have sleep-lessness?	3	2	1
Do you have head-aches?	3	2	1
Do you have wet palms?	3	2	1

40. Can you do the following without help?

	Yes	No
Wash yourself in most instance	1	2
Get dressed	1	2
Move up stairs without stopping	1	2
Walk half a kilometer without a rest	1	2
Run 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 overburdened in the last month?

1 yes - my life is almost unbearable

2 yes - more than is usual for people

3 yes - somewhat but no more than is usual for people

4 not at all

42. Have you ever had chest pain?

1 no

2 yes (go to question 44)

43. Have you ever had pressuring or symptoms 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 along? (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 street or trail)?
    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 a
    nitrate pill and go on).
    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 better (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 $\frac{1}{2}$ 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 to walk in my work and carry a lot of things or have to climb staircases often or go uphill. Examples: carpenter or peasant, work in an 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 a lot. Examples: forestry work, heavy farmwork, heavy construction and industrial work

51. How much physical activity do you have during your leisuretime? 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 am reading, watching television and doing things which do not need physical activity

2 In my leisure-time I walk, ride a bicycle or move in some other ways requiring physical activity at least for four hours a week. Walking, fishing and hunting, light gardening and so on are included; but not going to and coming from work

3 In my leisure-time I have physical activities to maintain my fitness such as running, skiing, gymnastics, swimming, ball-games or doing heavy gardening or such for at least three hours a week

4 I do regular training in my leisure-time several days a week for competing in running, orientation, ball-games or in other physically heavy-burdened sports events

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 more than one hour a day

53. How often do you do physical activities lasting at least 20 - 30 minutes which make you short of breath and to sweat?

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 do because of my disease or disability (go to question 60)

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

_____ 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 a typical week? (If not at all, mark 0.)

_____ km

57. How do you consider your present physical
condition?
    1 very good
    2 reasonably good
    3 moderate
    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 to 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 been smoking in your life?
    1 no (proceed to question 73)
    2 yes

62. Have you ever been smoking 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 are a current smoke, 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 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 currently

68. Do you want to stop smoking?

    1 no

    2 yes

    3 I'm not sure

    0 I don't smoke currently

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 currently

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, advised 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

DIET

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 cafeteria

       3 at the work site cafeteria

       4 somewhere else

       0 I don't eat luncheon

    b) the evening meal (between 3 and 9 p.m.)

       1 at home

       2 in a restaurant or a cafeteria

       3 at the worksite cafeteria

       4 somewhere else

       0 I don't eat an evening meal

74. What type of 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 in my home

75. What type of 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 in my home

76. How many cups of coffee or tea do you usually have a day? If you don't drink any, put a "0"

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 use milk or cream in your coffee?

    1 no milk or cream

    2 milk

    3 cream

    0 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 drink milk do you usually use:

    1 whole milk (ordinary cow's milk, fat percentage about 4.3 % or more)

    2 regular milk (fat percentage about 3.4 %)

    3 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 of pork?

    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) raw or cooked?

    1 never

    2 1 - 2 days

    3 3 - 5 days

    4 6 - 7 days

84. How often, during the last week, have you eaten
fruits or berries?

1 not at all

2 1 - 2 days

3 3 - 5 days

4 6 - 7 days

85. Do you usually drink sweet soft drinks?

1 never

2 once a week or less 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 been drinking during the last
week (seven days)? (If you have not drunk at all
answer 0.)

1 strong beer _____ bottles

2 mixed drinks_____ bottles

3 spirits_____ restaurant portions 4
(about 4 cl)

5 wine or equivalent _____ glasses

88. How often do you add salt to your meals at the
table?

1 never

2 when the food is not salty enough

3 almost always before tasting

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

1 iodized salt

2 sea salt

3 mineral salt

4 other salt

90. When you dine at the restaurant (some other place than home) 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. In your opinion, is 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 normally salted
   3 heavily 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 has advised 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. salted 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. pickles	1	2	3	4	5	6
e. sausages	1	2	3	4	5	6
f. ketchup, mustard or other spicy sauces	1	2	3	4	5	6

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

	no	yes
decreased the amount of fat	1	1
changed the type of fat	1	1
increased the use of vegetables	1	1
decreased the amount of sugar	1	1
decreased the amount of salt	1	1

97. Has your weight changed during 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 past year, have you participated in a session
where an expert has talked about smoking or a 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 unhealthy diet

2 stress

3 smoking

4 lack of physical activity

5 lack of vitamins, minerals etc.

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 a clearly enhanced
risk of getting heart disease than others. How great do you think your
own risk is 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
0 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 life-
    styles.

    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 at which I would like to reach for.
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

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 it is difficult to say
4 I disagree to some extent
5 I completely disagree

116. Change of diet among the middle-aged people 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 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

Annex II/2

PHYSICAL EXAMINATION RECORD FORM (to be completed by survey personnel)

1.   Height _____ cm

2.   Weight _____ kg

3.   Code of blood pressure measurer _____

4.   Number of slices of bread
     _____ slices/day

5.   Type of fat usually used on bread
     1 mostly soft margarine
     2 mostly regular margarine
     3 mostly mixed butter and oil
     4 mostly butter
     0 no butter or margarine at all

6.   Amount of fat usually put on a slice of bread (model slices 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 record (subsample)
    0 not in sample
    1 yes, instructions given
    2 no, refused to keep food record

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 disease. Every question has only one right answer. So choose only <u>one</u> alternative.

1. A cute myocardial infarction means in practice that
   1 a blood clot goes through the heart
   2 one of the coronary arteries is blocked
   3 the rhythm 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 swelling of the feet
   3 symptoms very uncommonly
   4 I don't know

4. The occurrence of 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 of the next is in excess in the Finnish 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, during the exercise one has to
    1 sweat a lot and breathe heavily
    2 sweat slightly and breathe a little more than normally
    3 sweat and breathe 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 a pipe as much as a cigarette, smoking is
    1 more dangerous
    2 as dangerous
    3 not so dangerous
    4 I don't know

15. Short term sense of chestpain 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 traffic
    2 industry
    3 smoking
    4 I don't know

17. If a middle-aged man has in his chest intensive chestpain for more than half
    an hour, he should
    1 take medication to relieve the 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 previously have exercised, recover from their 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 vitamins?
    1 very much
    2 somewhat
    3 not at all
    4 I don't know

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

22. The exercise is most important for health for the sake of
    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. The Finnish people use salt daily per person on an average

    1 less than 1 g

    2 3-5 g

    3 10-15 g

    4 I don't know

28. The recommeded 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 vitamins

    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 the first year of life the baby 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 the 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 against 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 when preparing the meal
    4 I don't know

MONITORING OF THE DIET WITHIN FINMONICA

Data on diet is collected in three different ways in all three monitoring areas:

1) The main questionnaire contains 27 questions concerning dietary habits

    - fat (cooking, milk, fat on bread, fatty meat)
    - sugar (with coffee and tea, drinks, sweets)
    - eggs
    - salt (salting habits, salt taste level, salty food stuffs, advice to reduce salt)
    - alcohol
    - vegetables, fruit and berries
    - meal pattern
    - possible changes during the past year

This questionnaire is sent to all subjects.

2) A three-day food consumption record concerning a subsample of about 23 % of the original sample. Persons born on 7-12th day of any month are given both oral and written instructions, the record forms, a model form and a return envelope (instructions, a record form and a model form in appendix I-III).

    Food consumption records are started on the following morning after receipt of the forms and kept for three days. The completed records are sent in the return envelope to the National Public Health Institute. There they are checked by a nutritionist and those forms not acceptable are rejected. The records are coded with the help of equivalence tables tailor-made for MONICA in order to convert household measures into grams. These are then processed to get data on food consumption and nutrient intake.

    The list of foods and nutrients used in the computer system for processing food intake data are:

    <u>9 main and 25 subgroups of food:</u>

    1 cereals
       - rye, wheat, other, legumes and nuts
    2 vegetables
       - potatoes, roots, other
    3 fruits and berries

4 fat
- margarine, oil, butter

5 milk
- milk, cheese, other

6 meat
- pork, beef, sausage, inner organs and blood

7 fish

8 eggs

9 drinks and others
- coffee, tea, alcoholic drinks, soft drinks, sugar, syrup, honey, other

Nutrients
- energy in Kcal and KJ
- proteins, carbohydrates, fats
- vitamins A, retinol, thiamine, riboflavine, niasine, vitamin C
- cholesterol
- fatty acids (7 saturated, 1 monounsaturated, 4 polyunsaturated)
- carbohydrates: starch, saccharose, lactose, other
- alcohol
- 24 minerals (K, Ca, Mg, P, S, Fe, Cu, Mn, Zn, F, Se, Mo, Br, Rb, Al, Si, B, Hg, As, Cd, Co, Cr, Ni, Pb)

3) Bread fat inquiry is made in the survey situation. Fresh models of bread slices (dark bread, slices about 30 g each with butter amount of 2.5 g, 5 g, 10 g, 15 g) are on the table. The answers to the following three questions are written on the last page of the general questionnaire:

1. Average bread consumption (slices per day)
2. Quality of fat used on bread
3. Quantity of fat used on bread compared to fresh bread models

The scheme of the collection of nutrition data is as follows

general questionnaire by mail	(home)
fat bread inquiry	(health centre by nurse in survey situation)
checking general questionnaire	(health centre by nurse in survey situation)
oral and written instructions for food consumption records, record forms, model form and return envelope	(health centre by nurse in survey situation)
food record form filled in by the subject	(home)
food record form returned by mail	(NPHI)

INSTRUCTIONS ON KEEPING FOOD CONSUMPTION RECORDS

You are requested to keep a food consumption record during three consequtive days by using the enclosed forms. Please, write down all foods and beverages consumed during those days starting tomorrow morning.

- Start each day on a new page.
- Fill in the first four boxes by a pencil (time, place, description of food and the amount), and leave the rest of the boxes empty.
- Please, check that your name, the date and day of week are written down on every page.

Time

Write down in this box the exact time when you are eating or drinking something. It is important that you record the right time even if you eat something very little, e.g.a. a few sweets.

Place

Write down the place of eating, e.g. home, restaurant, cafeteria at work, friend's house etc.

Description of food

Write down in this box a clear description of the food or beverage that you have consumed in the place you mentioned and at the time you wrote down.

It is important to mention the quality of the food by using exact descriptions. For example whole milk, low-fat milk, skim milk, low-fat cream, whipping cream, Swiss cheese, cottage cheese, salami, bologna sausage, cream cracker, rye cracker, wheat bread, rye bread, etc. Whenever the product has a brand name, please, write that down.

When you describe a dish, write down the method of food preparation (if it is boiled or fried or grilled) and if you know the type of fat that has been used in the preparation, write that down. For example: meatballs fried in butter.

Also write down whether the food is home-made or it is bought ready-made. If you know that your home-made food differs from the "normal" Finnish food, write down the whole recipe. An example of this follows in the enclosed model form.

Use as many lines as you wish to describe the foods properly.

Portion sizes

Write down the portion sizes of the foods of beverages already described. Use household measures such as coffee cups, tablespoons, teaspoons, decilitres or grams. If you have a kitchen scale use that for weighing for example fruit, slices of bread, portions of salad etc. whenever possible.

Estimate the portion sizes of different foods as follows:

Beverages: Use glasses, cups, or deciliters. Beer can be measured either in bottles or deciliters, and hard liquor in deciliters. Milk or cream added to coffee or tea should be measured in teaspoons or tablespoons.

Soups: Use deciliters whenever you can or describe the size of the portion as small, medium or big portion.

Sauces: Use tablespoons or deciliters. Note that even the amount of meat sauce such as spaghetti sauce should be estimated this way.

Meat and fish dishes: Estimate the amount of meat or fish by comparing it to an egg or by using centimeters or the palm of your hand.

Salads: If you cannot weigh the portion, use deciliters, cups or tablespoons as measures.

Butter and margarine: Use levelled teaspoons or tablespoons.

Sugar: Use pieces of sugar or levelled teaspoons or tablespoons. Remember to mention also sprinkled sugar on top of porridges etc.

Bread and pastry: Use amounts of slices of bread and describe the size of one slice as small, medium or large and the thickness in centimeters (e.g. medium size slice, 1 cm thick). Describe the pastry as small, medium or large, and if you have a scale, weigh it.

Cold cuts: Write down the number of slices and the size of one slice in centimeters or somehow else. Examples: 3 slices of salami, cut in the butchery very thin, 4 slices of Swiss cheese cut at home with a cheese plane, 4 x 6 centimeters each.

Other foods: Use the information given in the package whenever you eat something that has been wrapped such as a chocolate bar or the like to get the weight of the portion.

IT IS VERY IMPORTANT THAT YOU FILL IN THE FORMS AS CAREFULLY AS POSSIBLE.

THANK YOU FOR YOUR CO-OPERATION!

MONICA-Project: Monitoring of
cardiovascular diseases and their
risk factors

FINMONICA
Part of the international
MONICA study
co-ordinated by WHO.
Co-ordination in Finland:
National Public Health
Institute, Helsinki

ACUTE MYOCARDIAL INFARCTION
REGISTER
(1.1.1982 -)

INSTRUCTIONS HOW TO FILL OUT THE RECORD FORM

The record form has to be completed for every suspected acute myocardial infarction
case if the patient is permanent resident of the monitoring area (question 7) and is aged
from 25 to 64 yrs. If the patient has a new heart attack within 4 weeks from the onset of
the primary attack it is not registered as a new case. If the patient has a new heart
attack after 4 weeks from the onset of the primary attack a new record form is
completed. The name and complete address of the patient and his/her next of kin are
recorded at the top of the record form. Other questions will be answered by choosing the
correct or best-fitting alternative and by recording the number to the right of the
questions in the box or by writing it down on the lines reserved for this purpose.

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

Background information

1. Name of patient: _____
   address: _____
   telephone: _____

2. Name of spouse or closest relative or person alive: _____
   address: _____
   telephone: _____

3. Identification number   1-5

4. Personal identification code   6-15
   (includes date of birth)

5. Age (years) at onset of the attack   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. Site of first admission   21-22

01 North Karelia Central Hospital   20 Turku University Central Hospital
02 Joensuu City Hospital   21 Turku City Hospital
03 Outokumpu, health centre   22 Other institution in Turku
04 Lieksa   -"-   30 Loimaa District 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
09 Kitee   -"-   (only sudden death cases)
10 Liperi   -"-
11 Tohmajärvi   -"-
12 Kontiolahti   -"-
13 Other insitution in North Karelia

9. Was the patient later transferred to the Central Hospital?   23

1 yes
2 no

10. Occupation (at present or before retirement)   24

1 agriculture
2 forestry
3 industrial, mining, construction etc.
4 office work, service occupation, student etc.
5 housewife
6 retired

11. Occupational status prior to attack   25

1 was occupied during 3 months prior to attack
2 was not occupied but this was due to non-medical reasons
3 unable to work, health insurance payment
4 unable to work, disability payment
5 retired because of age

12. History of AMI   26

0 yes, confirmed from the hospital records on the basis of register data*)
1 yes, confirmed
2 yes, not confirmed
3 no

*) identification number of the last definite
   or possible AMI

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

14. First source of information   29
    (leading to registration)

    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 source of information (from family doctor, nursing home etc.)

15. Current smoking (prior to attack if has been smoking during   30-31
    3 months prior to attack). Number of cigarettes,
    cigars and pipefuls per day.

16. Date of onset of the attack   32-37

17. Status at the first examination   38

    1 alive
    2 cardiac arrest
    3 deceased (including unsuccessful resuscitation)

18. Status after 28 days follow-up   39

    1 alive
    2 deceased

19. Was the patient under systematic cardiac rehabilitation   40
    during hospitalization

    1 yes
    2 no

Complications since the first examination

20. Cardiac arrest   41

    1 yes
    2 no

21. If resuscitated, was the resuscitation successful (the patient   42
    was alive at least 24 hours since the resuscitation)
    1 yes
    2 no
    3 no resuscitation

REGISTER DIAGNOSIS (to be completed by the monitoring centre)

22. History of pain (symptoms)   43

    1 typical
    2 atypical
    3 other
    4 none
    5 insufficient data
    9 no data

23. ECG findings   44

    1 definite
    2 probable
    3 ischaemic
    4 other
    5 uncodable
    9 no data

    By which criteria
    of the protocol coded   45

    Localization (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 diagnosis (ICD-code) according to hospital record or death certificate	50-54
Other diagnoses	55-59
	60-64

Laboratory 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, highest value)	76-79
MB (%, highest value)	80-81
S-GOT (U/l, highest value)	82-85
MB (U/l, highest value)	86-89
total LD (U/l, highest value)	90-93
LD1 (U/l, highest value)	94-97
LD1 (%, highest value)	98-99

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

32. Date of death (day, month, year)	100-105
33. Survival time	106

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 performed   107

    1 yes, medico- pathological
    2 yes, forensic
    3 no

35. History of prior CHD

    1 definite or possible AMI
    2 confirmed CHD
    3 possible CHD
    4 obviously no history of CHD
    5 no information

36. ECG: Number of ECGs after the onset of attack
    (to reach the diagnosis)   108
    (if $\geq$ 5, code 5)

37. Death after an followed invasive procedure (3 days)   109

    1 yes
    2 no
    9 no information

Diagnostic data

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

_____
_____
_____
_____
_____

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

    1 localisation_____

_____
_____
_____
_____
_____

    2 duration_____

_____
_____
_____
_____

3 impact of nitrates _____

_____
_____
_____
_____
_____

4 intensity and use of analgesics_____

_____
_____
_____
_____
_____

41. Diagnostic laboratory results with dates

date	CK	CK-MB %-U/l	GOT	LD	LD1 %-U/l

42. ECG (see text next page)

INSTRUCTIONS

The record form is completed for every heart attack among persons under 65 years of age when acute myocardial infarction is suspected on the basis of chest pain, ECG or elevated serum enzymes.

If a person dies not medically attended a suspicion of acute myocardial infarction can arise on the basis of typical or atypical symptoms, autopsy findings or previous coronary heart disease.

If a new heart attack occurs within 28 days from onset of a former registered acute myocardial infarction it is considered as a complication of the first one and not registered as a new attack. If a new heart attack occurs later than 28 days from onset of a former registered attack, it must be registered as a new case.

The symptoms of acute myocardial infarction are to be coded as typical when there is a retrosternal pain at the beginning of the attack
- lasting more than 20 minutes
- no definite non-cardiac cause found.

The symptoms are to be coded as atypical when there is atypical pain, shock, vertigo, collapse or acute left ventricular failure in the absence of cardiac disease other than ischaemic heart disease and no definite non-cardiac cause is found.

Serum specimens for cardiac enzyme tests should be drawn at least on the first and second day of treatment. The results have to be recorded in the respective space of the record form.

In addition to the completed record form of every registered case
- pieces of most typical ECGs consisting of at least 3 QRS complexes of all 12 leads and which are taken at least the first, second, third and fifth on days since the onset of attack, and
- a photo-copy of the summary of the hospital record should be sent to the monitoring centre

From the North Karelia Central Hospital, from Turku monitoring centre, from Loimaa District Hospital and from Kuopio monitoring centre the completed record forms will be sent to

AMI REGISTER
National Public Health Institute
Mannerheimintie 166
00280 Helsinki 28
(tel. 90 47441)

MONICA-Project:

Monitoring of Cardiovascular Diseases and Their Risk Factors

FINMONICA:Part of the WHO coordinated study

DEAR ADDRESSEE

One year has passed since you were treated for your heart attack. We would like to ask you how you are doing now. Would you please complete the attached questionnaire? All information will be highly confidential. All responses given are used only for public health research and therefore in favor of yourself. We wish to receive your response at your earliest convenience.

The questions should be answered by writing the answer down on the appropriate space or by circling the number in front of the suitable alternative. For example:

1. Age _37_ years
2. Sex   1 male
              2 female

Check in the end that you have answered to all the questions. Please return the questionnaire as soon as possible in the attached envelope.

Note! IF THE ADDRESSEE CANNOT BE CONTACTED

If the addressee cannot be contacted please notify the reason:

     at hospital; hospital _____

     moved; new address _____

     deceased; date of death _____ day _____ month 19_____

Sincerely

National Public Health Institute/AMI Register

Prof. Pekka Puska	Dr. Matti Arstila	Dr. Esko Kaarsalo	Dr. Harri Mustaniemi
Helsinki	Turku	Loimaa	Joensuu

THE QUESTIONNAIRE

1. Name _____

2. Date of birth _____ day _____ month _____ year

Treatment after the heart attack

3. How many times have you been treated on a hospital ward after the heart
    attack a year ago?

    _____ times   17

4. How many times have you seen a doctor after the heart attack a year ago
    (counting visits to hospital outpatient departments, to the health center,
    to private practitioners etc.)

    _____ times   18-19

Status at present

5. Are you currently at hospital   20
    1 yes
    2 no

6. Are you currently   21
    1 bed-ridden
    2 convalescent
    3 doing relatively well
    4 completely recovered

7. Do you think you are at present   22
    1 disabled
    2 partly disabled
    3 able to work

8. After the heart attack a year ago did you go on with your work or did
    you change your work or did you remain totally outside of working life?   23
    0 I was not working prior to attack (retired, long-term unemployment)
    1 I left my work for good
    2 I changed my employer
    3 I changed my work to a less strenuous one having the same employer
    4 I went on with my previous work

9. Do you receive health insurance payment at present?   24
    1 no
    2 yes

10. Do you receive disability imbursement at present?   25
    1 no
    2 yes, for a defined period
    3 yes, indefinitely

11. How many months since your heart attack did you return to work?
    _____ months   26-27
    99 = disabled to work indefinitely

12. Do you get breath lessness, pain or feeling of pressure in your chest?   28
    1 never or only in strenuous exercise
    2 yes in moderate exercise, e.g. walking up steps or a hill
    3 yes in slight exercise, e.g. walking on ground
    4 yes in all kind of exercise and sometimes even at rest

13. During the previous month how often have you taken a short-acting
    nitroglycerin tablet?   29
    0 not at all
    1 less than once a week
    2 1-2 times a week
    3 3-6 times a week
    4 once a day on the average
    5 several times a day

14. When did you smoke last time? If you are a current smoker circle
    number 1.   30
    1 within the previous month
    2 during 1 month to half a year ago
    3 during half a year - a year ago   proceed to
    4 more than a year ago   question 16
    5 I have never smoked regularly

15. How much do you smoke currently or did smoke before you stopped
    on the average per day?   31-32
    altogether about _____ cigarettes, cigars or pipes per day

16. How often do you have physical exercise during your leisure time which
    makes you short of breath or to sweat?   33
    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 have physical exercise because of my disease

17. Have you attended any cardiac rehabilitation programme since your
    heart attack a year ago?   34
    1 no
    2 yes

18. Date of answering

    _____ 19 _____   35-40
    day   month   year

Thank you for your cooperation. This information will be used for research purposes only
in order to find out how to improve the health of the Finnish people after the heart
attack.

As you have had a heart attack we request you to follow carefully the instructions of your
doctor as well as other instructions given for heart patients.

MONICA-Project: Monitoring of
cardiovascular diseases and their
risk factors

FINMONICA
Part of the international
MONICA study
co-ordinated by WHO.
Co-ordination in Finland:
National Public Health
Institute, Helsinki

STROKE REGISTER
(1.1.1982 -)

INSTRUCTIONS HOW TO FILL UP THE RECORD FORM

The record form has to be completed of every suspected stroke case if the patient is
permanent resident of the monitoring area (question 7) and is aged from 25 to 74 ys (in
Turku, persons older than 74 years also are included). If the patient has a new stroke
within 4 weeks from the onset of the primary attack it is not registered as a new case. If
the patient has a new stroke after 4 weeks from the onset of the primary attack, a new
record form has to be completed. If the patient dies within 4 weeks from onset of the
attack the questions concerning death has to be filled up, (too as well as the follow-up
information).

The name and complete address of the patient and his/her next of kin are recorded at the
top of the record form. Other questions will be answered by choosing the correct or best-
fitting alternative and by recording the number to the right of the question in the box or
by writing it down on the lines reserved for this purpose. The completed record forms
must be sent from the site of first admission as soon as possible: in North Karelia to the
neurological out-patient clinic of the North Karelia Central Hospital ("Stroke register"),
in Turku to the Turku AMI and stroke register and in Kuopio to the stroke register,
Department of Neurology, Kuopio University Central Hospital.

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

Background information

1. Name of patient:_____
   address:_____
   telephone:_____

2. Name of spouse or closest relative or person alive: _____

   address:_____
   telephone:_____

3. Identification number   1-5

4. Personal identification code   6-15
   (includes date of birth)

5. Age (years) at onset of the attack   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. First source of information   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 source of information (from family doctor, nursing
  home etc.)

9. Site of first admission   22-23

01 North Karelia Central Hospital	20 Turku University Central Hospital
02 Joensuu City Hospital	21 Turku City Hospital
03 Outokumpu, health centre	22 Other institution in Turku
04 Lieksa -"-	30 Loimaa District 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
09 Kitee -"-	(only fatal cases)
10 Liperi -"-	
11 Tohmajärvi -"-	
12 Kontiolahti -"-	
13 Other institution in North Karelia	

10. Residency prior to attack   24

1 home
2 central hospital
3 district hospital
4 health centre ward or city hospital
5 hospice ward
6 nursing home
7 other institution

11. Living conditions   25

     1 living alone
     2 living accompanied with other people
     3 permanently institutionalized

12. Status prior to attack   26

     1 occupied during 3 months prior to the attack or if unoccupied
       due to reasons other than health status or old age
     2 unable to work because of health reasons
     3 retired, but did not require help in self-care
     4 retired needing assistance in caring him/herself

13. History of AMI   27

     1 no
     2 yes, more than 28 days prior to the attack
     3 yes, less than 28 days prior to the attack
     9 unknown

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

     1 no
     2 yes, not confirmed
     3 yes, confirmed
     9 unknown

15. Has your blood pressure been measured during previous
     3 years (more than 28 days before the attack)   29

     1 no
     2 yes, normal
     3 yes, elevated or person has antihypertensive medication
     4 yes, low
     5 yes, blood pressure value not known

16. Date of onset of the attack   30-35
     (day, month, year)

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

17. Where treated   36
     1 home
     2 central hospital
     3 district hospital
     4 health centre or city hospital
     5 hospice ward
     6 nursing home
     7 other institution
     8 deceased

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

    1 no
    2 yes

19. Does the patient need assistance in caring him/herself?   38

    1 no
    2 yes, to some extent
    3 yes, complete help
    4 deceased

20. Test and methods performed
    1 = yes, 2 = no, 3 = unknown

    a) Inspected by GP   39

    b) by internist   40

    c) by 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

    Description of symptoms and signs (most important sign, please attach the
    summary of medical record)

    _____
    _____
    _____
    _____
    _____

21. Duration of neurological symptoms*)   50

    0 less than 24 hours
    1 less than 7 days but more than 24 hours
    2 7 days or more

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

    Diagnoses leading or influencing to the condition above   56-60

                                                              61-65

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

23. Date of death   66-71
    (day, month, year)

24. Survival time (days)   72-73

25. Was autopsy performed   74

    1 no
    2 yes, medico-pathological
    3 yes, forensic

REGISTER DIAGNOSIS (TO BE COMPLETED BY MONITORING CENTER)

25. Stroke   75

    1 yes
    2 no
    3 insufficient information

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

27. Death followed after an invasive procedure (3 days)   81

    1 no
    2 yes

*) Extract from WHO MONICA Protocol:

    Stroke is defined as rapidly developed clinical signs of focal (or global) disturbance
    of cerebral function, lasting more than 24 hours or leading to death with no
    apparent cause other than a vascular origin.

In the monitoring area of Kuopio an identical record form is used with the exception
of items 7 and 9 in which the municipalities and sites of first admission are listed as
follows:

Item 7: Municipality   19 - 20

50 Kuopio	60 Leppävirta	68 Tuusniemi
52 Iisalmi	61 Nilsiä	69 Varkaus
54 Juankoski	62 Pielavesi	71 Vesanto
55 Kaavi	63 Rautalampi	72 Maaninka
56 Karttula	64 Rautavaara	73 Tervo
57 Keitele	65 Siilinjärvi	74 Varpaisjärvi
58 Kiuruvesi	66 Sonkajärvi	75 Vehmersalmi
59 Lapinlahti	67 Suonenjoki	76 Vieremä

Item 9 : Site of first admission   22 - 23

50 Kuopio University Central Hospital	64 Rautavaara Health Centre
51 Kuopio Health Centre	65 Siilinjärvi Health Centre
52 Iisalmi District Hospital	66 Sonkajärvi Health Centre
53 Iisalmi Health Centre	67 Suonenjoki Health Centre
54 Juankoski Health Centre	68 Tuusniemi Health Centre
55 Kaavi Health Centre	69 Varkaus District Hospital
56 Karttula Health Centre	70 Varkaus Health Centre
57 Keitele Health Centre	71 Vesanto Health Centre
58 Kiuruvesi Health Centre	75 Vehmersalmi Health Centre
59 Lapinlahti Health Centre	76 Vieremä Health Centre
60 Leppävirta Health Centre	80 Other institution in Kuopio
61 Nilsiä Health Centre	90 Hospital elsewhere in Finland
62 Pielavesi Health Centre	91 Treated only at home
63 Rautalampi Health Centre	92 Medically unattended (only sudden death cases)