

## European Health Risk Monitoring (EHRM)



## Reporting the Risk Factor Survey Data

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Hanna Tolonen, Markku Mähönen, Kari Kuulasmaa, Aulikki Nissinen

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  - URL: <http://www.ktl.fi/ehrm/documents/product3/title.htm>
- Correspondence to
  - Hanna Tolonen (hanna.tolonen@ktl.fi)  
Department of Epidemiology and Health Promotion  
National Public Health Institute (KTL)  
Mannerheimintie 166  
FIN-00300 Helsinki  
Finland  
fax: +358 9 4744 8338

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## **Introduction**

The European Health Risk Monitoring (EHRM) Project (1) is part of the European Commission's (EC) Health Monitoring Programme (HMP) (2). The EHRM Project has prepared recommendations for the EC on indicators for major chronic disease risk factors and on international collaboration needed for collecting the data through surveys. The Project has also prepared a survey protocol and operational guidelines for the data collection (3).

One of the tasks for the EHRM Project, specified in the project proposal, was analysing the existing data to be applied in the EU health monitoring database. An important part of such existing data was the international WHO MONICA data set, which was readily available in the EHRM coordinating centre. The European Commission had a separate activity ongoing for the technical implementation of the EU database through which the structured health information would be disseminated (4). The plan of the EHRM Project was to collaborate with the developers of the EU health monitoring database. When it became apparent that the technical development of the EU database will not reach the stage, were it could usefully collaborate with producers of the data, the task specified for the EHRM project was modified accordingly. The two parts of the modified task were (a) to apply the indicators suggested by the Project (3) to the existing WHO MONICA data set to test that the suggested indicators are logical and their implementation works technically, and (b) to develop principles for the contents of the reports of the information.

This document deals with the principles of the contents of the routine reporting of the health monitoring information. It focuses on the ways of reporting the data for different target groups, and on the type of information that needs to accompany the actual data. It does not address the list of health issues that should be reported nor the technical aspects of reporting. The document gives the current view of the authors, based on their earlier experience in reporting and work with the users of such data. It was inspired by a number of recent conferences on health and health behaviour monitoring and the discussions in the HMP project coordinators' meeting. The focus of the document was largely determined by issues on which there was not necessarily a common understanding within the HMP.

Hypertension and related aspects, and data from the Finnish health risk monitoring are used in the examples. The Finnish data was used because it was most easily available to the authors.

The European Community Health Indicators (ECHI) Project (5) has compiled a list of health indicators to be monitored in the Member States. The ECHI Project has also outlined reporting practices, and have created the concept of "user-windows". Their focus has been on ways of building user-windows for the different needs of the EC. They have defined different reporting levels by suitable grouping of indicators for different user groups. We are separating different user groups, in the EU-level and nationally, from the point of view of the level of detail of the information that should be reported. Therefore this report is complementary to the user-window discussion of the ECHI Project.

This document has not been discussed widely among the participants of the EHRM Project. It aims to give one point of view to the discussion on reporting. It is

recognized that the reporting will, or at least should, be a dialogue between the reporters and those who need the data, and therefore the forms and contents of reporting are expected to develop continually from year to year and for different uses of the data.

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## References:

1. European Health Risk Monitoring (EHRM) Project web site at <http://www.ktl.fi/ehrm/>
2. Decision No 1400/97/EC of the European Parliament and of the Council of 30 June 1997 adopting a programme of Community action on health monitoring within the framework for action in the field of public health (1997 to 2002). Available from [http://europe.eu.int/comm/health/ph/programmes/monitor/docs/prog\\_en.pdf](http://europe.eu.int/comm/health/ph/programmes/monitor/docs/prog_en.pdf)
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4. Management summary of the EUPHIN gip. Available from [http://europe.eu.int/comm/dgs/health\\_consumer/library/tenders/call26\\_1\\_en.pdf](http://europe.eu.int/comm/dgs/health_consumer/library/tenders/call26_1_en.pdf)
5. Design for a set of European Community Health Indicators. Final report by the ECHI project. February 15, 2001. (Projects final report for EC)

## 1. Target groups and their needs

There is wide need for the health information collected through risk factor surveys. This kind of information is of interest to the general public, people working on prevention, health care professionals, teachers, policy makers and researchers. The type and detail of information needed by the different target groups should be taken into account when reporting the survey data.

### 1.1 Target groups

#### General public

The public in large get information about the health threats and the development of health in population through mass media, like daily newspapers, TV and radio news and also from internet. For them, the information needs to be in easily understandable format and focusing on the most essential.

#### Health care personnel and other people working on health promotion

Health care personnel, like doctors and nurses, and other people working on health promotion need health information in their every day work. For them it is important to know the developments in the population's health and its determinants, like changes in the prevalence of obesity, hypertension and smoking. They also need the current knowledge about the relations of different health determinants.

They usually get information from mass media, internet, medical journals, conferences and organizations such as the national cancer or heart associations. For

them, the results need to be more detailed than for general public, including data by different population subgroups to help to plan and target prevention activities.

### **Teachers and students in health education**

The target group for the education can be the general public or health care professionals. Health education of the general public is often conducted through prevention campaigns and doctors and nurses treating patients. Education of health professionals includes the training of new doctors and nurses but also providing re-training of doctors and nurses who already are on the field.

Health educators usually get the latest health information from medical journals, conferences and the internet.

### **Policy makers**

Policy makers in national and also in European Union level use health information for the planning of health care resources. They get the needed information from mass media, internet, directly from experts, special reports prepared for them and possibly also from medical journals and conferences.

### **Researchers**

Researchers are interested in development of health in population but also about all possible explanations for the changes and interactions between health indicators. They want to know details about the data collection methods and their effects on the results.

For researchers most important source of information is medical journals and conferences but also internet and mass media.

## **1.2 Hierarchy in reporting**

To cover the needs of the different target groups, three levels of reporting are suggested:

1. Level 1: basic results + minimum background information
2. Level 2: basic results + additional background information
3. Level 3: detailed results + detailed background information

### **Level 1**

Level 1 of the reporting would mainly be targeted for general public and policy makers. Other target groups may get information first from this level and then go to the other levels for more details.

Reporting health survey results for Level 1 will require short and clear presentation. Detailed descriptions about the methods behind the results are often not of interest. Detailed information can be reported separately and they should also be taken into account when making conclusions from the results. (See [Section 2.4](#).)

Whenever possible, Level 1 reporting, should be in the native language of the reader.

### **Level 2**

Level 2 of the reporting would mainly be targeted for health care professionals and other personnel working in prevention or education.

The reporting requires basic results as for Level 1 and additional background information. Basic description about the used data collection methods, like those used for blood pressure measurement, and also some discussion about the quality of the data should be included . (See [Section 2.4.](#))

The native language of the reader is the first choice, but also English can be used.

### **Level 3**

Level 3 of the reporting mainly targets for researchers, who require more detailed descriptions of the results, data collection methods and data quality than given in Level 2. (See [Section 2.4.](#))

For Level 3 the native language of the reader is not needed because the scientific community communicates largely in English.

## **2. Reporting of the results**

In addition to the actual risk factor survey results, the report should include information about the target population which the results refer to, the way how the data was collected (measurement protocol), the quality of collected data, the definition of used indicators in reporting and the interpretation of the results. The extent to which all these are reported depends on the target group whom the results are meant for.

Everybody who is interested in the basic risk factor survey report should have an easy access to it. The report should be available in several languages to facilitate its use by all target groups. The World Wide Web (WWW) is a convenient medium for distributing the report. A WWW-interface for an interactive database, from which the requested reports would be generated, would facilitate the use of user-selected language even for the legends and titles of the figures and tables of the report.

Examples in this document give general outlook of the reporting which can be used as well in internet as printed reports. For simplicity, they are only in English.

## **2.1 Definition of target population and sampling**

### **2.1.1 Target population**

#### **Level 1**

The definition of the target population needs to be given in the report. This definition should include the geographical area (country, region, town, etc.) covered by the target population as well as the age group and gender. It is also important to specify the exclusion of any population subgroups, such as certain ethnic groups, non-citizens

or those who do not speak some major languages of the country. (See [Example 2.1.1](#).)

**EXAMPLE 2.1.1** Target population of Finnish risk factor survey in 1992. Level 1 information.

### **Population**

A random sample of the adult population (25-64 years of age) was studied in three areas of Finland In 1992:

- Kuopio Province: former province of Kuopio
- North Karelia: former province of North Karelia
- Turku/Loimaa: City of Turku and adjacent rural area around the town of Loimaa



### **Population size**

The total population of age group 25-64 in these three areas was 340 000.

### **Survey organizer**

Survey was organized and conducted by National Public Health Institute, Helsinki.

### **Level 2**

The Level 2 reporting should describe in more detail the representativeness of the results. Response rates help to see if the proportion of the sample that participated to the survey is high enough to give reliable representation of the target population. (See [Example 2.1.2.](#))

**EXAMPLE 2.1.2** Target population in Finnish risk factor survey in 1992. Additional, Level 2 information.

### Response rates

The over all response rate in 35-64 years old men and women was 80 %. It was 81 % in Kuopio Province, 77 % in North Karelia and 82 % in Turku/Loimaa.

### Level 3

The Level 3 should report the details that may be relevant for thorough investigation of the results. To facilitate this, information on population distribution and response rates by smaller area, age group and gender is useful. If the data are reported by socio-economic status, also information about socio-economic distribution of population are needed. (See [Example 2.1.3.](#))

**EXAMPLE 2.1.3** Target population in Finnish risk factor survey in 1992. Detailed, Level 3 information.

### Population size

The population distribution in 1992 by area, age group and gender was:

Kuopio province

North Karelia

Turku/Loimaa

Age group	Men	Women
25-34	19382	18074
35-44	22390	19923
45-54	15970	15245
55-64	13112	14272

Age group	Men	Women
25-34	12834	11898
35-44	15664	13473
45-54	10960	10031
55-64	9066	9703

Age group	Men	Women
25-34	15550	15347
35-44	15585	15615
45-54	12864	13124
55-64	9856	11721

### Response rates

Response rate (%) is a number of persons participating to the survey divided by eligible sample size. The response rates by area, age group and gender in 1992 were:

Kuopio province

North Karelia

Turku/Loimaa

Age group	Men	Women
25-34	71	83
35-44	69	84
45-54	81	84
55-64	82	84
35-64*	77	84

Age group	Men	Women
25-34	58	73
35-44	69	79
45-54	72	85
55-64	74	87
35-64*	72	83

Age group	Men	Women
25-34	69	77
35-44	72	85
45-54	76	86
55-64	85	86
35-64*	78	86

\* Age standardized to the Word population by 10-year age groups with weights 12, 11 and 8 (1).

## 2.1.2 Sampling

### Level 1

For Level 1 no other information than the sample size is needed. (See [Example 2.1.4.](#))

**EXAMPLE 2.1.4** Sampling in Finnish risk factor survey in 1992. Level 1 information.

#### Sample size

The total eligible sample size was 5 917.

### Level 2

For Level 2, additional to Level 1 information, basic information about the sampling frame should be provided. (See [Example 2.1.5.](#))

**EXAMPLE 2.1.5** Sampling in Finnish risk factor survey in 1992. Additional, Level 2 information.

#### Sampling frame

The sampling frame was the national population register (<http://www.vaestorekisterikeskus.fi/prc.htm>) which includes all the residents of the country and which is updated continuously.

### Level 3

Level 3 should report the detailed sampling information. Additionally to previous levels, the sampling method should be described. (See [Example 2.1.6.](#))

**EXAMPLE 2.1.6** Sampling in Finnish risk factor survey in 1992. Detailed, Level 3 information.

#### Sample size

The eligibility of the person to the sample was defined at the time of survey. The individual selected to the original sample was eligible if he/she still lived in the survey area and was alive during the time of survey examination.

The eligible sample size by area, age group and gender were:

Kuopio province

Age group	Men	Women
25-34	244	243
35-44	249	249
45-54	248	250
55-64	249	249

North Karelia

Age group	Men	Women
25-34	236	243
35-44	246	242
45-54	245	246
55-64	243	246

Turku/Loimaa

Age group	Men	Women
25-34	248	248
35-44	248	249
45-54	249	249
55-64	249	249

#### Sampling methods

In each area, simple random sampling, stratified by sex and 10-year age group, was used. No population groups were excluded from the sample.

## References

1. Waterhouse J, Muir CS, Correa P, Powell J (eds.) *Cancer incidence in five continents*. Lyon, IARC, 1976 (Vol. 3, pl 456)

## 2.2 Used measurement protocols and quality of collected data

The used questions, measurement devices for physiological measurements and the actual measurement procedures can affect the results. The quality of the data is reflected in the reliability of the results.

### 2.2.1 Used measurement protocols

#### Level 1

In Level 1, the primary interest is in the outcome not on the methods of the data collection. There is usually no need to report the measurement protocols but their impact to the obtained results needs to be incorporated to the interpretations of the results. However, the agency which organized the survey should always be reported (see [Example 2.1.1](#)).

#### Level 2

The population level measurements require higher accuracy than is usually required in clinical practice. For Level 2 it is desirable to report for example the type of blood pressure measuring device that was used or whether total cholesterol was measured from serum or plasma. The detailed methodological descriptions can be omitted. (See [Example 2.2.1](#).)

**EXAMPLE 2.2.1** Measurement protocol. Blood pressure measurement protocol in Finnish risk factor survey in 1992. Level 2 information.

<b>Device:</b>	Simple mercury sphygmomanometer
<b>Position of subject:</b>	Sitting
<b>Arm of the subject used for measurement:</b>	Right
<b>Number of measurements:</b>	2; the mean of these was used in the analysis

#### Level 3

Level 3 should report the details of the measurement protocol. The reporting should include the questions that were used for questionnaire of interview data, the time of the year and day of the physiological measurements, the type of measurement devices and the measurement procedures. Also information about the characteristics (gender, age and profession) of personnel conducting the measurements and their training are of interest. (See [Example 2.2.2](#).)

**EXAMPLE 2.2.2** Measurement protocol. Blood pressure measurement protocol in Finnish risk factor survey in 1992. Detailed, Level 3 information.

**Side of stethoscope:** Bell

**Width of the bladder of the cuff(s):** 14 cm

The blood pressure was measured using WHO MONICA Project protocol (1).

**Season:** 1992: January-March

### Questions relating to blood pressure measurements and hypertension

#### Original questions used locally:

Have you ever had your blood pressure measured? When was the last time?

1. during the past  $\frac{1}{2}$  year
2.  $\frac{1}{2}$  year - 1 year ago
3. 1 year - 5 years ago
4. over 5 years ago
5. never

Have you ever been diagnosed to have high or elevated blood pressure?

1. no
2. yes

Have you ever used hypertension medications?

1. no
2. yes

When have you last time taken hypertension medications?

1. today or yesterday
2. 2-7 days ago
3. 1 week -  $\frac{1}{2}$  year ago
4.  $\frac{1}{2}$  year - 1 year ago
5. 1 year - 5 years ago
6. over 5 years ago

**MONICA questions used to derive indicators used in examples (The original data were transformed to this format before the analysis.):**

HIBP: Have you ever been told by a doctor or other health worker that you have high blood pressure?

1. yes
2. no
9. insufficient data

Are you taking (in the last two weeks) drugs for high blood pressure?

1. yes
2. no
3. uncertain
8. if HIBP=2

- insufficient data

Have you had your blood pressure measured in the last year?

1. yes
2. no
9. insufficient data

## 2.2.2 Quality of collected data

The reliability of the risk factor survey results depend on the quality of the collected data. The quality is influenced by several issues, such as measurement procedures, selection of survey personnel, their training, used measurement instruments, timing of the measurements, data management, and quality control. Assessing and summarizing the quality of the data is important and will have an effect on the conclusions drawn from the data.

### Level 1

In Level 1, where the interest is in conclusions from the data, detailed information about the data quality is not required. For this level, the quality information should be incorporated to the conclusions.

### Level 2

For Level 2 reporting, the basic data quality information is needed in the level of data reliability and representativeness. In this level, like in Level 1, the main quality information should be taken into account in the reported interpretation of the results. (See [Example 2.2.3.](#))

**EXAMPLE 2.2.3** Quality of data. Quality of blood pressure data in Finnish risk factor survey in 1992. Level 2 information.

The change in cuff width between surveys (see [Example 2.2.2](#)) may cause some bias to the blood pressure trend estimates. Otherwise, the quality of blood pressure measurement data was high and there are no quality concerns.

For international comparisons, it should be remembered that surveys were conducted during the winter months (January-March/April). Blood pressure levels tend to be lower during the winter months than in the summer.

### **Level 3**

Detailed quality information should be reported in Level 3. The quality of each measurement can be scrutinized step by step to pin point possible problems and their effects to the results. Good examples of this level of quality reporting are the Quality Assessment Reports of the WHO MONICA Project (<http://www.ktl.fi/publications/monica/index.html>). (See [Example 2.2.4](#).)

**EXAMPLE 2.2.4** Quality of data. Quality of blood pressure data in Finnish risk factor survey in 1992. Detailed, Level 3 information.

The detailed description of the quality of blood pressure data is given in the MONICA blood pressure quality assessment report (2). Here, the summary of that report is given.

#### **Characteristics of the measurers**

The blood pressure was measured by a team of 4 measurers in each area. All measurers were female nurses. Two of the measurers in each team were younger than 25 years, one was between 25 and 35 years and one was over 35 years of age. To assure comparability between the three areas, each team was working a third of their time in each area.

#### **Training of the measurers**

All measurers were trained and certified before they started their work on the field. To qualify for the training, the candidates had to pass a hearing test. The training covered all aspects of the measurement protocol. The certification included the use of audio tapes and Y-stethoscope, replicated measurements, and checking of the last digit preference, but no fixed number of correct measurements was required.

#### **Quality control during the survey**

During the survey, terminal digit preference was checked as well as intra-measurer variation. The checks were done weekly.

#### **Measurement quality**

A summary score of blood pressure measurement quality was determined from the actual survey measurements. It comprises proportion of incomplete measurements, proportion of odd readings, terminal digit preference, proportion of identical results in duplicate blood pressure measurements and within survey time trends. The summary score attains values between zero and two, with zero meaning that there are serious quality problems, score one that there is some quality concerns and score two that there is no quality concerns in the blood pressure measurement data. The quality score

was 2 for Kuopio Province and North Karelia, and 1 for Turku/Loimaa, suggesting that there are no serious quality problems.

## References:

1. WHO MONICA Project. WHO MONICA Manual. Part III. Population Survey. Section 1. Population Survey Data Component. (1997) Available from: URL:<http://www.ktl.fi/publications/monica/manual/part3/iii-1.htm>, URN:NBN:fi-fe19981151
2. Kuulasmaa K, Hense H-W and Tolonen H for the WHO MONICA Project. Quality Assessment of Data on Blood Pressure in the WHO MONICA Project. (1998) Available from URL:<http://www.ktl.fi/publications/monica/bp/bpqa.htm>, URN:NBN:fi-fe19991082

## 2.3 Definition and interpretation of used indicators

The definitions of the health indicators used in the report should be given in order to avoid unnecessary misinterpretations and misunderstandings. For example, hypertension can be defined using different cut-points for systolic and diastolic blood pressure, and the interpretation of the results is impossible if the definition of reported indicator is not given (see [Example 2.3.1.](#)).

**EXAMPLE 2.3.1** Hypertension can be defined in several ways starting from different cut-points for systolic and diastolic blood pressure and the use of drug treatment information. The prevalence of hypertension can vary from 27% to 56% in men, and from 21% to 49% in women depending on the used definition. (see [Table 2.3.1.](#)).

Definition	Prevalence of hypertension	
	Men	Women
Systolic blood pressure $\geq$ 160 mmHg or diastolic blood pressure $\geq$ 95 mmHg	27%	21%
Systolic blood pressure $\geq$ 160 mmHg or diastolic blood pressure $\geq$ 95 mmHg or using drugs for hypertension	34%	29%
Systolic blood pressure $\geq$ 140 mmHg or diastolic blood pressure $\geq$ 90 mmHg or using drugs for hypertension	56%	49%

Some population indicators based on survey data give only an estimate of the real situation. This needs to be emphasized in the interpretations of the indicators. For example, the prevalence of hypertension ([Table 2.3.1.](#)) does not mean that 56% of men are hypertensives in the clinical sense, but tells that 56% of men had elevated blood pressure during the survey examination or used drugs for hypertension. Clinical definition of hypertension would require a sustained elevation of blood pressure in a series of measurements over time, not only one time measurement like in the risk factor surveys.

### Levels 1 and 2

For Levels 1 and 2, the definition of the indicator and its interpretation to target population should be given (see [Example 2.3.2](#)).

**EXAMPLE 2.3.2** Definition and interpretation of indicators. Blood pressure indicators used in Finnish risk factor survey in 1992. Levels 1 and 2 information.

### **Prevalence of hypertension**

#### **Definition**

The proportion of subjects with:

- systolic blood pressure at least 140 mmHg or
- diastolic blood pressure at least 90 mmHg or
- presently using hypertension medication.

#### **Interpretation**

The indicator aims to provide a picture of the prevalence of hypertension in the population. However, it usually overestimates the true prevalence of hypertension in population because it is based on a measurement on a single occasion and therefore counts one as hypertensive if blood pressure happens to be high during the measurement due to individual variation. The clinical definition of hypertension is based on sustained high blood pressure.

#### **Note**

Blood pressure levels are continuously related to the risk of cardiovascular disease and therefore the definition of hypertension is arbitrary. The definition used in this report is based on the 1999 guidelines of the World Health Organization and International Society of Hypertension (Guidelines subcommittee. 1999 World Health Organization - International Society of Hypertension guidelines for the management of hypertension. *J Hypertens* 1999; 17: 151-183. Also available from <http://www.eshonline.org/documents/whoish99.pdf>). Earlier a definition of hypertension using cut-points  $\geq 160$  mmHg for systolic and  $\geq 95$  mmHg for diastolic blood pressure was used commonly. Such a definition produces lower prevalences which are not comparable with those reported here. (See [Example 2.3.1](#).)

### **Proportion of population with blood pressure measurement in the past year**

#### **Definition**

The proportion of population who have had blood pressure measured during the past year.

#### **Interpretation**

The indicator reflects the coverage of the screening of the population for hypertension.

#### **Note**

This indicator differs from the EHRM recommendation for the primary indicator, which is defined as the proportion of the population with blood pressure measurement in the past 5 years. The deviant definition is used in the current report, which uses data from the WHO MONICA Project, because MONICA asked only about the measurements in the past year.

### **Awareness of hypertension**

#### **Definition**

The proportion of hypertensive subjects who have ever been told to have elevated blood pressure or hypertension.

#### **Interpretation**

The indicator measures the detection of hypertension in the population by the health care system. A low proportion indicates that a large percentage of the hypertensives are undetected and therefore remain outside the possibility of treatment of the disease. Note that the ideal target for this indicator is less than 100% because not all classified as hypertensives in the analysis are not true hypertensives (see "Prevalence of hypertension" above).

#### **Note**

This indicator differs from the EHRM recommendation for the indicator, where the question on awareness refers to the past 12 months rather than to "ever". The deviant definition is used in the current report, which uses data from the WHO MONICA Project, because MONICA asked only if person has ever been told to have high blood pressure.

### **Prevalence of treatment among hypertensives**

#### **Definition**

The proportion of hypertensives who are taking medication to lower their blood pressure.

#### **Interpretation**

The indicator measures effectiveness of the health care system in the treatment of hypertension. A low proportion indicates there is a large number of the subjects in the population who would benefit from the medical treatment of hypertension. Note however, that the ideal target for this indicator is less than 100% because medication is not the only treatment for hypertension and the denominator does not only include truly hypertensive persons (see "Prevalence of hypertension" above).

#### **Level 3**

In Level 3 additionally to Levels 1 and 2 information, the detailed algorithm for deriving the indicator from the collected data is needed (See [Example 2.3.3.](#)).

**EXAMPLE 2.3.3** Definition and interpretation of indicators. Blood pressure indicators used in Finnish risk factor survey in 1992. Detailed, Level 3 information.

The indicators given the examples of this document differ from the EHRM recommendations because this document uses data from the WHO MONICA Project, where the questionnaire differed slightly from the one recommended by EHRM. For clarity, only algorithms for the indicators used in this document are given.

### **Prevalence of hypertension**

The algorithm uses the following measurements and questions used in MONICA:

- MSBP = mean of the first and second systolic blood pressure measurement
- MDBP = mean of the first and second diastolic blood pressure measurement
- DRUGS = Are you taking (in the last two weeks) drugs for high blood pressure? 1 = yes, 2 = no, 8 = I don't have high blood pressure, 9 = insufficient data

The prevalence of hypertension was calculated among respondents who had all four blood pressure measurement (two systolic and two diastolic measurements) and who responded to the hypertension treatment question (excluding the subjects with DRUGS = 9). The numerator for the prevalence was the number of respondents with  $MSBP \geq 140$  or  $MDBP \geq 90$  or DRUGS = 1.

### **Proportion of population with blood pressure measurement in the past year**

The algorithm is based on a question used in MONICA:

- BPRECD = Have you had your blood pressure measured in the last year? 1 = yes, 2 = no, 9 = insufficient data

Proportion of population with blood pressure measurement in the past year was calculated among all respondents who have responded to the question about the last time when their blood pressure was measured (excluding BPRECD = 9). The numerator for the proportion was the number of respondents with BPRECD = 1.

### **Prevalence of awareness of hypertension**

The algorithm is based on measurements and questions used in MONICA:

- MSBP = mean of the first and the second systolic blood pressure measurement
- MDBP = mean of the first and the second diastolic blood pressure measurement
- HIBP = Have you been told by a doctor or other health worker that you have high blood pressure? 1 = yes, 2 = no, 9 = insufficient data

The prevalence of awareness of hypertension was calculated among respondents who were defined as hypertensives (see the numerator of "Prevalence of hypertension" above) and who responded to the questions about the awareness of elevated blood pressure (excluding HIBP = 9). The numerator for the prevalence was the number of respondents with HIBP = 1.

### **Prevalence of treatment among hypertensives**

The algorithm is based on measurements and questions used in MONICA:

- MSBP = mean of the first and second systolic blood pressure measurement

- MDBP = mean of the first and second diastolic blood pressure measurement
- DRUGS = Are you taking (in the last two weeks) drugs for high blood pressure? 1 = yes, 2 = no, 8 = I don't have high blood pressure, 9 = insufficient data

The prevalence of treatment among hypertensives was calculated among respondents who are defined as hypertensives (see the numerator of "Prevalence of hypertension" above). The numerator for the prevalence was the number of respondents with DRUGS = 1.

## 2.4 Presentation and interpretation of the results

### 2.4.1 Presentation of the results

#### Level 1

In Level 1, the results should be presented using simple figures usually for men and women separately. Also results for different age groups should be presented separately if the nature of the results requires that. Figures should be easy to read, include only limited number of details and convey a clear message.

Major concerns about the data quality should be indicated and low quality data should be omitted from the presentations.

The figures should have a short written explanation of the results, followed by a brief interpretation (see [Example 2.4.1](#) and [2.4.2 Interpretation of the results](#)).

**EXAMPLE 2.4.1** Presentation of the results. Prevalence of hypertension, its awareness and treatment in Finland in 1992. Level 1 information.

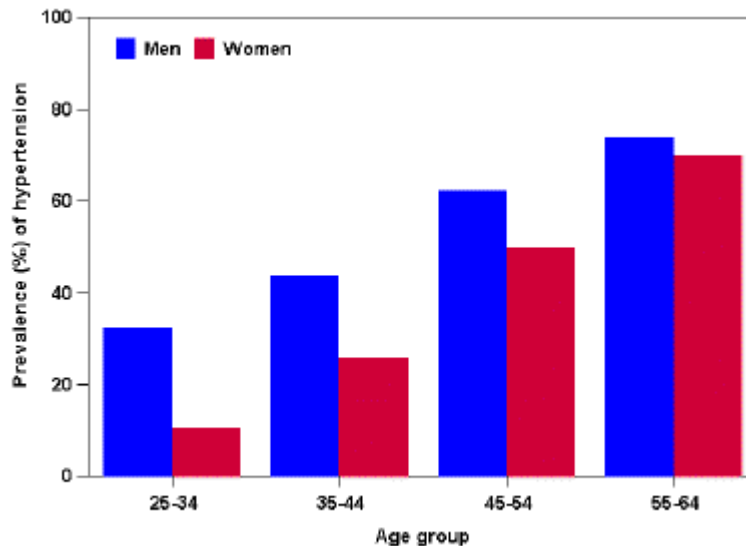
#### Public health impact of hypertension

Hypertension is an important and modifiable risk factor for brain haemorrhage, heart failure and other cardiovascular diseases and renal failure. Blood pressure can be reduced by increasing the physical activity, reducing the overweight, reducing salt intake and fat content of food and also by pharmacological treatment. All these except pharmacological treatment can be modified by changes in lifestyle.

#### Prevalence of hypertension in Finland in 1992

##### Hypertension

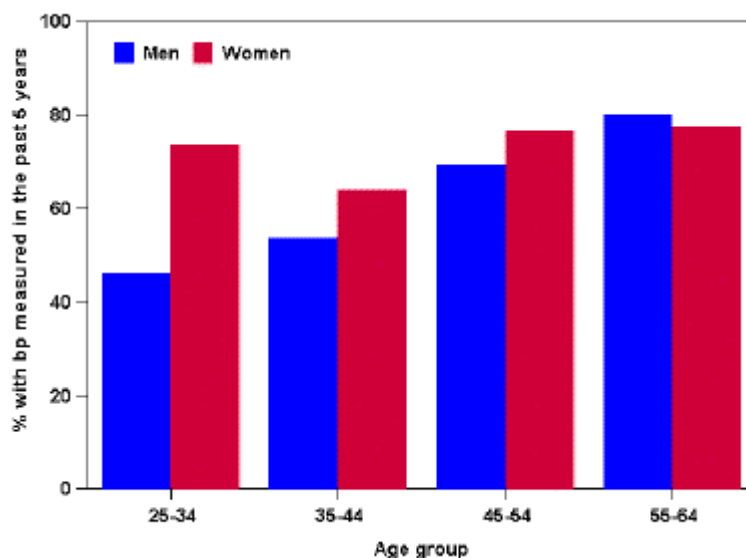
In 1992, the estimated prevalence of hypertension varied from 32% to 71% in men and from 11% to 70% in women between age groups. The prevalence is high in international comparison. The prevalence of hypertension increased by age in both men and women. In young men (aged 25-34 years) the prevalence was substantially higher than among women of the same age. (Figure 2.4.1.)



**Figure 2.4.1** Prevalence (%) of hypertension in Finland in 1992

### Proportion of population with blood pressure measurement in the past year

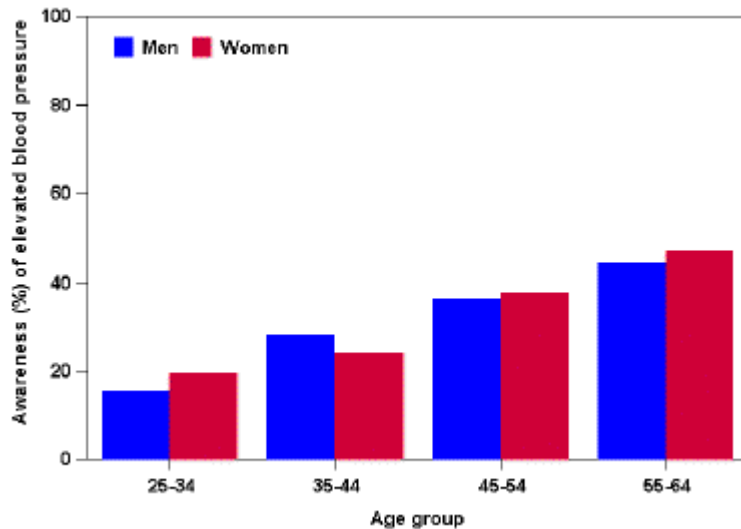
Most of Finns have had their blood pressure measured in the past year. Among young men (25-34 years of age) the proportion was much lower than in young women. The difference between men and women disappeared with increasing age (Figure 2.4.2.)



**Figure 2.4.2** Proportion (%) of population with blood pressure measurement in the past year

### Awareness of hypertension

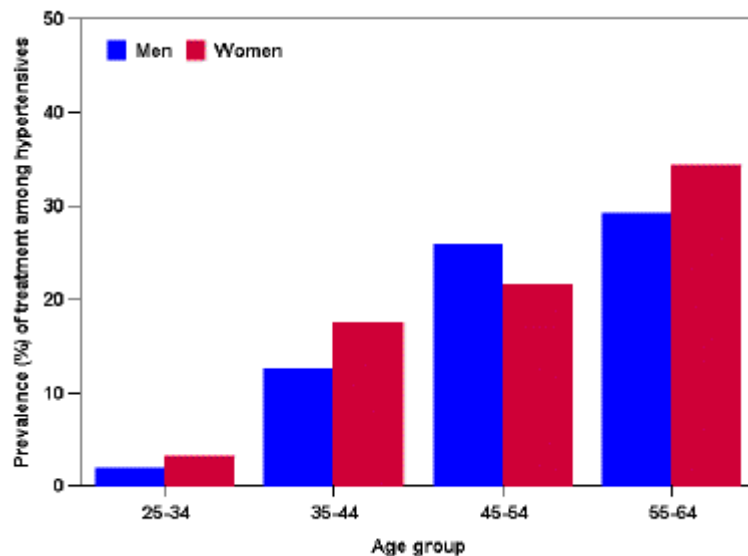
Among hypertensives (see [Section 2.3](#)), less than 20% of the 25-34 years old population were aware of their elevated blood pressure. The proportion increased with age but remained below 50% in all age groups. (Figure 2.4.3.).



**Figure 2.4.3** Awareness (%) of elevated blood pressure among hypertensives

### Drug treatment of hypertension

Among 25-34 years old hypertensives (see [Section 2.3](#)), 2% of men and 3% of women had antihypertensive drug treatment. The treatment remained below 40% in all age groups in both sexes. (Figure 2.4.4.)



**Figure 2.4.4** Prevalence (%) of drug treatment of hypertension among hypertensives

Results should also be presented by area, and time trends should be given when ever the information is available. Also comparisons between countries are of interest, as they facilitate international collaboration in the interpretation of the results and in the search for methods to improve the public health. The presentations of the comparisons follow the same basic structure than presentation of results from a single population. The feasibility of assessment of time trends and international comparisons is dependent on the standardization of the measurements and reporting.

### Level 2

In Level 2, the Level 1 information should be complemented with basic tables giving the number of subjects in each group and standard errors of reported mean values and prevalences.

The explanation should include results from the figures and additional tables and have an interpretation of the results (see [2.4.2 Interpretation of the results](#)).

### **Level 3**

For Level 3 more details behind the basic figures are needed. This detailed information can be presented in tables or with additional figures, but can also be presented as references to separate publications and reports. (see [2.4.2 Interpretation of the results](#)).

The explanations and interpretations should be more extensive, discussing different aspects of the results and possible implications or problems. In discussion also some questions can be raised. The explanations and discussion are typically presented as references to separate scientific publications.

## **2.4.2 Interpretation of the results**

### **Level 1**

The public health impact of the results should be discussed, taking into account possible quality issues and representativeness of the results. (see [Example 2.4.2](#)).

**EXAMPLE 2.4.2** Interpretation of the results. Prevalence of hypertension, its awareness and treatment in Finland in 1992. Level 1 information.

### **Limitations of the data**

These results are not representative for whole Finland but only for three areas, two in eastern Finland and one in the western part of the country. Nonetheless, the results give some idea of situation in the country as a whole.

The actual prevalence of hypertension in population is likely to be somewhat lower than estimated here. Clinical definition of hypertension requires a series of blood pressure measurements over time. Here the definition is based on one time measurement during the survey examination when the blood pressure could have been elevated due to several other reasons than actual hypertension.

### **Conclusions**

The results show that hypertension is a major public health problem in the country. The higher prevalence in men than women is striking but in accordance with results from other countries. This phenomenon can have several reasons. One potential reason is that among the youngest age group (25-34 years), women's blood pressure is monitored during pregnancy and also measured during annual visits to the physician if they are using oral contraceptives. The same is suggested by the big sex difference in the proportion of women whose blood pressure was measured in the past year (Figure 2.4.2).

Among the older age groups, the proportion of the population with blood pressure measurement in the past year is reasonably high, and therefore cannot explain the high prevalence of hypertension. Although the measurement rate is high, the awareness of hypertension is relatively low. It is likely that that current internationally agreed definition of hypertension, which uses lower cut-points for systolic and diastolic blood pressure than the old definition, has not reached the medical practice. Lower levels of single measurement of blood pressure than in the past should be followed up for diagnosing of possible hypertension.

The low proportion on hypertensives receiving antihypertensive medication can be explained partly by non-pharmacological therapy, which should be the first step in the treatment. However, it is likely that there also exists undertreatment of hypertension.

## **Level 2**

Level 2, additional to the Level 1, should give possible instructions to the health care personnel on issues raised by the results. For the case of example 2.4.4, references to national and/or international guidelines for the management of hypertension could be given (e.g: Guidelines subcommittee. 1999 World Health Organization - International Society of Hypertension guidelines for the management of hypertension. J Hypertens 1999; 17: 151-183. Also available from <http://www.eshonline.org/documents/whoish99.pdf>).

## **Level 3**

Possible questions for more thorough investigation, risen by the results, could be specified and discussed here.

# **3. Conclusions**

Reporting results from the risk factor survey is an important but difficult part of the survey. Different levels of detail are optimal for different uses and target groups of the reporting. In this document we have suggested a three-level principle for basic reporting of survey data, where the amount of detail varies between the levels of reporting. Regardless on the level of reporting, some information is always needed about

- the target population and sampling (**2.1 Definition of target population and sampling**),
- who collected the data and how reliable are the results (**2.2 Used measurement protocols and quality of collected data**), and
- what is the meaning of the indicators used in the reporting (**2.3 Definition and interpretation of used indicators**).

In the long term, there should be a dialogue between the reporters and those who need the data, and the reporting should be developed continuously according to the accumulating experience.