

<b>MANAGEMENT IN HEALTH CARE PRACTICE</b> A Handbook for Teachers, Researchers and Health Professionals	
<b>Title</b>	<b>HEALTH SURVEYS AS A POWERFUL TOOL IN PLANNING PUBLIC HEALTH INTERVENTIONS</b>
<b>Module: 2.5</b>	<b>ECTS (suggested): 0.25</b>
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<b>Keywords</b>	Survey, cross-sectional study, public health intervention programmes, CINDI programme,
<b>Learning objectives</b>	After completing this module students should: <ul style="list-style-type: none"> <li>• know the role of cross-sectional surveys as an effective tool in planning public health interventions;</li> <li>• know the position and importance of cross-sectional surveys in evidence-based public health;</li> <li>• be familiar with some cases of domestic and foreign cross-sectional surveys.</li> </ul>
<b>Abstract</b>	Health surveys are observational epidemiological studies of health status of the population in which usually a cross-section through frequency and characteristics of health outcomes and other health related events like exposures are studied and therefore provide prevalence data. Surveys are very applicable in searching for general insight in health states and conditions that last a relatively long time as well as various risk factors for them. Their results could be efficiently used in planning public health interventions, and in fact today they represent one of the most important tools of evidence based public health The module is presenting basic theoretical background necessary for understanding the usefulness of health surveys in planning public health interventions, as well as it provides a case study.
<b>Teaching methods</b>	An introductory lecture gives the students first insight in characteristics of cross-sectional studies. The theoretical knowledge is illustrated by a case study. After introductory lectures students first carefully read the recommended readings. Afterwards they discuss the characteristics of health surveys and their potential power for effective health care planning, especially in the field of public health. In continuation, they need to find published materials (e.g. papers) on health surveys and present how they were used (or supposed to be used) in planning public health interventions.

<b>Specific recommendations for teachers</b>	<ul style="list-style-type: none"> <li>• work under teacher supervision/individual students' work proportion: 30%/70%;</li> <li>• facilities: a computer room;</li> <li>• equipment: computers (1 computer on 2-3 students), LCD projection equipment, internet connection, access to the bibliographic data-bases;</li> <li>• training materials: recommended readings or other related readings;</li> <li>• target audience: master degree students according to Bologna scheme.</li> </ul>
<b>Assessment of students</b>	Multiple choice questionnaire.

# HEALTH SURVEYS AS A POWERFUL TOOL IN PLANNING PUBLIC HEALTH INTERVENTIONS

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## THEORETICAL BACKGROUND

### Basic definitions and explanations of terms

#### *Surveys and health surveys*

Surveys could be defined in several ways, two of them being:

- according to A Dictionary of Epidemiology (1), surveys are defined as investigations in which information is systematically collected but in which the experimental method is not used, and
- according to Rossi and Freeman, surveys are systematic collection of information from a defined population, usually by means of interviews or questionnaires administered to a sample of units in the population (2,3).

Health surveys are surveys designated to provide information on the health status of a population. They could be descriptive, exploratory, or explanatory. Synonym for a disease frequency survey is a cross-sectional study (1).

In health surveys data could be collected by the means of questionnaires (face-to-face interview, telephone interview, or self-completed questionnaires), or by the means of health examination, usually in combination with interview. According to which tool is used to collect data in health surveys, there exist two main types of them (4):

- health interview surveys or HIS - surveys in which collection of data is carried out only by the means of questionnaires. In HIS, questionnaires may be communicated to the study subjects in three ways: through mail questionnaire, through personal or face-to-face interview or through telephone interview,
- health examination surveys or HES - surveys which are usually a combination of questionnaires and health examination including diagnostic and laboratory tests. In HES, the contact between participants and research personnel is personal since the health examination is a component part of the survey. In this type of surveys, also questionnaires are usually communicated to the selected study subjects through personal interview.

#### *Cross-sectional studies*

There exist several similar definitions of cross-sectional studies:

- according to A Dictionary of Epidemiology (1), cross-sectional studies are studies that examine the relationship between diseases or other health-related characteristics, and other phenomena of interest in a defined population at a particular time,
- a summary of several other definitions is that cross-sectional studies are observational epidemiological studies of health status of the population in which a »snap-shot« of or a cross-section through frequency and characteristics of health outcomes and other health related events like exposures are studied (5-9). This characteristic also gave the name to this type of epidemiological studies, cross-sectional studies are studies that measure the prevalence of health outcomes or

determinants of health, or both, in a population at a specific point in time, or over a short period (7).

Health outcomes and other health related events could be measured in cross-sectional studies on different measurement scale. In those cross-sectional studies in which the outcome event is dichotomous the prevalence of this dichotomous event is recorded. This is the reason that cross-sectional studies are also called prevalence studies (6, 5, 10, 11). Prevalence studies thus could be on one hand regarded as a subgroup of cross-sectional studies (11), while on the other hand all cross-sectional studies could be regarded as prevalence studies since we can dichotomize values of every observed outcome.

The selected specific point in time could be a time window within which data are collected (e.g. calendar week or month). It could also be a specific point in time in the course of events, differing in respect of each individual study subject with regard to the actual time (beginning of schooling, retirement, etc.) (6, 12, 13).

Frequently, cross-sectional epidemiological studies are designated as cross-sectional surveys (7).

Detailed description of cross-sectional studies' characteristics is given in numerous textbooks and handbooks including advantages and disadvantages (5, 7, 11, 13), aims (5, 6, 7, 9, 14), methods and tools (1, 4, 7, 10, 12, 15-18), and course (phases and periods) (7, 10, 19-21).

Although all phases/periods of cross-sectional studies' course are important, planning period is the most important and most sensitive period. If designing and planning the cross-sectional study in the wrong way, the whole study could be set on an inappropriate basis, and the deficiencies of this period are very difficult to be eliminated in the later phases of the cross-sectional studies. In order to avoid as many faults as possible, the course of the cross-sectional studies must be planned systematically and with all due care. A precise management of individual cross-sectional study is very difficult to be advised. Nevertheless, common recommendations on actions in designing and planning phases of the cross-sectional studies exist (7,13,19,21,22-24).

### *Intervention and public health intervention*

Several definitions exist of what the intervention is, among which could be find the following:

- an intervention is a generic term used to denote all public actions e.g. policies, programmes, projects (25);
- an intervention is an action or programme that aims to bring about identifiable outcomes (26).

Planned/desired effects of an intervention expressed in terms of outcomes are general objectives of an intervention.

A public health intervention is an intervention, which is applied to many, most, or all members of a community, with the aim to deliver a specific benefit to the community or population as well as benefits to individuals (26,27). Public health interventions include (26,27):

- policies of governments and non-governmental organisations;
- laws and regulations;
- organisational development;
- community development;
- education of individuals and communities;
- engineering and technical developments;

- service development and delivery; and
- communication (including social marketing).

### **Cross-sectional surveys – an important tool in evidence based public health**

Today, cross-sectional surveys represent one of the most important tools of evidence based public health (14). Unfortunately, these studies are less powerful in comparison to randomized controlled trials - the main study design in evidence based medicine. Also the volume of evidence is smaller, and the time from intervention to outcome is longer (14). Nevertheless, they have some advantages over randomized controlled trials.

### **Countrywide Integrated Non-communicable Diseases Intervention (CINDI) programme surveys**

The World Health Organization (WHO) Countrywide Integrated Non-communicable Diseases Intervention (CINDI) programme is an intervention programme with integration as a key concept in prevention of chronic non-communicable diseases (28-30). It arose out of experiences of one of the first community-based health intervention projects in Europe - the North Karelia Project in Finland, which started in 1972 and reached remarkable achievements as well as global recognition (31).

Surveys which are aimed on one hand at assessment of burden of risk factors for non-communicable diseases, and on the other hand at evaluation of process of CINDI programme, are essential component part of this programme (29, 32). Today, we distinguish between two types of CINDI surveys (32, 33):

- CINDI Risk Factors and Process Evaluation surveys (30,32) - this type of surveys is a HES type of surveys, and represents a basic type of CINDI surveys which provide the basic data for starting a CINDI programme in a country, and on its progress. This type of surveys is in most CINDI countries performed on a level of demonstrational area or at most region,
- CINDI Health Monitor Survey (33) - this type of surveys is a HIS type of surveys his surveys which offer the most rough but comprehensive overview on the problems tightly associated with non-communicable diseases. This type of CINDI surveys is mostly aiming at monitoring, assessing and comparing the trend of health behaviour in CINDI countries with different politically-economic systems. Owing to comparability, monitoring should be conducted under the uniform methodology and on a national level.

## **CASE STUDY: COUNTRYWIDE INTEGRATED NON-COMMUNICABLE DISEASES INTERVENTION (CINDI) PROGRAMME AND RELATED SURVEYS IN SLOVENIA IN PLANNING PUBLIC HEALTH INTERVENTIONS**

### **Countrywide Integrated Non-communicable Diseases Intervention (CINDI) programme and related surveys in Slovenia**

There exist several types of surveys which provide important information for planning public health interventions for controlling non-communicable disease in Slovenia (34,35):

1. CINDI Health Monitor Survey (33-35) - This type of survey was performed in Slovenia for the first time in 2001 (36), for the second time in 2004, and for the third time in 2008. With its national and at the same time regional level, this type of surveys in Slovenia represent very strong support to development of evidence based policy on both levels, what is extremely important in the process of diminishing interregional differences. At the same time, it is very powerful tool for evaluation of the effectiveness of health promotion programmes. All databases include data on about 9000 participants' health behaviour.
2. CINDI Risk Factors and Process Evaluation Survey (30, 34, 35) - so far, there were three surveys performed at the demonstrational level (Ljubljana demonstrational region) – in winter 1990/1991, in winter 1996/1997, and in winter 2002/2003.
3. Ad-hoc surveys - among ad-hoc surveys, the Beltinci process evaluation surveys should be mentioned in the first place (37). With the means of two consecutive surveys of HES type of surveys the effect of one year intervention programme in Beltinci community was evaluated. The surveys were basing on CINDI Risk Factors and Process Evaluation surveys methodology.

These surveys and resulting data-bases are the basis for different specific studies aiming at planning as much effective public health interventions as possible.

### **CINDI Health Monitor Surveys as a tool for development of effective intervention programmes for enhancing healthy nutrition and physical activity in adult population**

#### *Background*

Behavioural risk factors are among the most important risk factors for non-communicable diseases (38,39). A study showed that prevalence of some risk factors for cardiovascular diseases among which unhealthy nutrition and physical activity habits seems to be the most unfavourable one in Eastern Slovenia (40). In order to determine population groups at highest risk for unhealthy behaviours in nutrition related to obesity and diabetes as well to determine population groups at highest risk for insufficient physical activity a special study was performed. The intention was to prepare a high quality basis for working out the strategies, guidelines/recommendations as well as concrete implementation action plans for long term diminishing high mortality attributable to non-communicable diseases (41).

## *Methods*

The data from CINDI Health Monitor (CHM) 2001 data-base were used (41). The sample size was 15,379 and the age range 25-64 years. The response rate was 63.8% (9,666 responses). The questionnaires of 9,034 respondents were eligible for analysis (eligibility criteria: sex and age provided by SORS). In analysis of unhealthy behaviours in nutrition related to obesity and diabetes all of them were considered, while in insufficient physical activity only 7,718 questionnaires of participants without any kind of disability (41).

Comprehensive synthetic indicators were constructed (41):

- complex indicator of unhealthy behaviours in nutrition related to obesity and diabetes was defined on the basis of several guidelines and recommendations (42-44), taking into account circumstances specific to Slovenia (cultural and economic), and possibilities of the CHM Questionnaire. Complex indicator was derived on the basis of several questions of the CINDI Health Monitor questionnaire on nutrition habits. The containment of energy in foods was the most important criterion to select questions to be incorporated in this complex indicator. All the most important components recommended by the WHO (high/frequent intake of high energy density foods, high/frequent intake of fats, especially those composed of saturated fat acids, high/frequent intake of sweet soft drinks) (45), available in our database, were taken into consideration (41). The participants were classified into three groups on the basis of the median value on the number of unhealthy components for the whole sample as follows: healthy (0 components); moderately unhealthy (1-2 components); very unhealthy (3-7 components). The prevalence of very unhealthy behaviour was observed (41),
- complex indicator on the average level of physical activity was derived on the basis of several questions as well. Questions were basing on International Physical activity Questionnaire (46) as suggested by the CINDI WHO. They were taking into account different types of physical activity - moderate physical activity, vigorous physical activity, or walking). According to type of physical activity and frequency (frequency of at least 4-times per week was considered as regular) participants were classified into the following groups: inactive, irregularly active, low intensity regularly active (regular walking), moderate intensity regularly active (regular moderate physical activity), and high intensity regularly active (regular vigorous physical activity). Absence of physical activity and irregular physical activity of any type or intensity were considered as insufficient physical activity and any regular physical activity (including regular walking which is one of popular types of regular physical activity in elderly in Slovenia) was considered as sufficient. The prevalence of insufficient physical activity was observed.

The observed outcomes were related to sex; age; level of education; employment; social class (self-classification); type of residence community, and geographical region.

On the basis of the logistic regression model, the risk-score for each participant was calculated and converted to the estimation of risk for the observed outcome. All participants were put in an array according to their risk estimate. Those with estimate values above the 95<sup>th</sup> percentile were classified in the very-high-risk group. The combinations of seven observed characteristics (sex, age, education, employment, social class, type of residence community, and geographical region) were then examined. Different combinations denoted different population groups' profiles. The most frequent profiles within the very-high-risk groups were observed. Those ranked as top 10 were considered as convenient for public health (PH) actions (41).

## *Results*

### **Very unhealthy nutrition related to obesity**

The highest odds ratios were observed in: men, aged 25-29 and 30-39, adults with lowest education level (uncompleted or completed primary school), heavy workers in rural economy, people self-classified in labour social class, those living in rural communities, and those living in Eastern Slovenia.

Risk for this unhealthy behaviour was possible to estimate in 8,052 participants with data on all seven factors considered in the multivariate analysis (89.1%). The highest estimated risk score value was 0.73, while the value of the 95<sup>th</sup> percentile was 0.59. 409 participants were classified on or above this cut-off point in the very-high-risk group for unhealthy behaviours in nutrition related to obesity and diabetes. Profiles, ranked on the top 10 ranking places according to frequency are presented in Table 1.

### **Insufficient physical activity**

The highest odds ratios were observed in: women, aged 25-29, adults with lowest education level (uncompleted primary school), administrative/intellectual workers and job seekers, people self-classified in lowest social class, those living in urban communities, and those living in Central Slovenia.

The highest estimated risk score value was 0.38, while the value of the 95<sup>th</sup> percentile was 0.28. 341 participants were classified on or above this cut-off point in the very-high-risk group for insufficient physical activity. Profiles, ranked on the top 11 ranking places (the profiles on 10<sup>th</sup> and 11<sup>th</sup> place had the same frequency and both had to be considered) according to frequency are presented in Table 2.

## *Discussion on using the survey results as a tool in planning public health interventions*

With the above-described methodology we succeeded to identify population groups at highest risk for two unhealthy behaviours related to chronic non-communicable diseases:

- In unhealthy behaviours in nutrition related to obesity and diabetes the worst situation was observed in Eastern Slovenia. This was expected as on general the unhealthiest traditional lifestyle from the nutritional point of view was seen to be in Eastern, and the healthiest in Western Slovenia (40). This thesis was confirmed by the basic results on elements of unhealthy behaviours in nutrition related to obesity and diabetes as well.
- Healthy nutrition habits e.g. consumption of sea food and olive oil were more expressed in Western Slovenia, while unhealthy nutrition habits e.g. consumption of lard, fried food, or sweet soft drinks were most expressed in the most eastern part (47). The results indicated that from the PH point of view in unhealthy behaviours in nutrition related to obesity and diabetes it was essential to start to intervene in Eastern Slovenia (41).

**Table 1.** Profiles, ranked on the top 10 places according to frequency within 409 respondents classified in the very-high-risk-group for very unhealthy nutrition related to obesity and diabetes: Slovenia, 2001

Profile Rank	Frequency N (%)	Risk	Sex	Age	Level of education	Employed	Social class	Residence	Community	Region
1	63 (15.4)	0.62	male	30-39	vocational	yes	labour	rural		eastern
2	41 (10.0)	0.59	male	30-39	vocational	yes	middle	rural		eastern
3	30 (7.3)	0.60	male	40-49	Primary	yes	labour	rural		eastern
4.5	28 (6.8)	0.69	male	30-39	Primary	yes	labour	rural		eastern
4.5	28 (6.8)	0.62	female	30-39	Primary	yes	labour	rural		eastern
6	20 (4.9)	0.59	male	40-49	uncompleted primary	yes	labour	rural		eastern
7	18 (4.4)	0.64	male	25-29	vocational	yes	middle	rural		eastern
8	16 (3.9)	0.66	male	25-29	vocational	yes	labour	rural		eastern
9	13 (3.2)	0.59	female	25-29	vocational	yes	labour	rural		eastern
10	11 (2.7)	0.60	male	25-29	vocational	yes	labour	rural		western

**Table 2.** Profiles, ranked on the top 11 places according to frequency within 341 respondents classified in the very-high-risk-group for insufficient physical activity: Slovenia, 2001.

Profile Rank	Frequency N (%)	Risk	Sex	Age	Level of education	Employed	Social class	Residence	Community	Region
1	31 (9.1)	0.28	female	30-39	secondary	yes	middle	urban		central
2	27 (7.9)	0.32	female	30-39	university	yes	middle	urban		central
3.5	18 (5.3)	0.30	female	25-29	secondary	yes	middle	urban		central
3.5	18 (5.3)	0.29	female	30-39	university	yes	upper middle	urban		central
5	14 (4.1)	0.28	female	40-49	university	yes	upper middle	urban		central
6.5	13 (3.8)	0.31	female	40-49	university	yes	middle	urban		central
6.5	13 (3.8)	0.28	female	25-29	university	yes	middle	urban		eastern
8.5	11 (3.2)	0.34	female	25-29	university	yes	middle	urban		central
8.5	11 (3.2)	0.30	female	40-49	college	yes	middle	urban		central
10.5	10 (2.9)	0.31	female	30-39	university	yes	middle	urban		western
10.5	10 (2.9)	0.28	female	30-39	college	yes	middle	suburban		central

- In insufficient physical activity there were many problems with interpretation of the results. We do strongly believe that this was the obvious consequence of the questionnaire used (41). A short last-7-days self-administered format of IPAQ is designed to observe at the same time vigorous and moderate physical activity, and walking of different sources (leisure time activities, housekeeping work, physical activity at the work-place, and transportation physical activity) (46). With regards to the impact of regular and sufficiently intensive physical activity on human health this inevitably means mixed-information data, which are less applicable for such types of observations. Despite significant amounts of energy could be spent in some of the considered types/modes of activity, not all kinds of physical activity are equally healthy - often they could be even unhealthy. Vigorous physical activity in compulsory positions of the body for a longer time periods, as it is the case in heavy physical workers in industry and rural economy, could be extremely unhealthy while periodical vigorous physical activity during the leisure time could constitute both physical and psychological relaxation and is obviously healthy. From the viewpoint solely to the daily expenditure of energy, it is understandable that the situation with regular physical activity was shown as it is the best in Eastern Slovenia, because the economy there is largely rural (47,48). On the contrary, another more in-depth survey, CINDI Risk Factors and Process Evaluation 2002/2003 survey, which comprised also some elements of health examination survey (and not only health interview survey), in cooperation with a multisectorial and multidisciplinary research project "Physical activity for health", showed that the prevalence of practicing regular leisure-time physical activity was the lowest in Eastern Slovenia, in rural environments, and in hard workers in rural economy (49). This indicated again that it was the priority to start with intervention programmes in the same part of the country with very similar population profiles as in nutrition, related to obesity and diabetes. On the basis of the results presented we can conclude that in view of future research on the impact of physical activity on health the part on physical activity in the CINDI Health Monitor questionnaire at the international level has to be reassessed as a lot of countries have already experienced similar problems with the same set of questions (50). Also we should try to assess the physical activity patterns of different population groups in the past as health condition in the present is mainly influenced by physical activity and nutrition habits in the past.

The results of this study, combined with results of other CINDI studies in Slovenia, confirmed that the situation in unhealthy behaviours in nutrition related to obesity and diabetes, and in leisure-time physical activity, is the worst in Eastern Slovenia, especially in Pomurje. Indirectly, the situation just described could be supported also by other results of the CHM survey, which showed that the percentage of obese adults (body mass index  $\geq 30.0$ ) was the highest in the Pomurje (18.8% in contrast to 9.7% in most North-Western region Nova Gorica) (51).

Changing the traditional lifestyle is one of the most important elements in reducing the unhealthy behaviours of different kind but extremely difficult, as a process is long lasting, and tightly bound to the political and economical situation of a country (52). In unfavourable socio-economic circumstances, the preservation of traditional lifestyle is endorsed and can be reduced only by strong multisectorial engagement (53). Such conditions currently exist in Eastern Slovenia (47,54). But despite unfavourable socio-economic circumstances in this region which could seriously affect the success of the PH interventions, the multisectorial and multidisciplinary project »Mura«, which started in 2001 in Pomurje, in only a couple of years offered several extremely positive results (37). It was a project based on intervention

programmes based on the pattern of a similar process in Finland, which proved as successful and effective (31). Its development and implementation was strongly supported by the results of presented study with its unique methodology as well by the results of related studies. Numerous multisectorial activities, including primary health prevention activities, were focused on changing the nutritional and physical activity behaviour of the population, and have been in process since the end 2001 at the regional (first in the Pomurje region) (37), as well as at the national level (55). With regard to health prevention activities, specific socio-economic and cultural circumstances were taken into consideration. On the level of population groups-at-risk the concrete health promotion and health education approach was already applied in Beltinci Community in Pomurje region (37), where the prevalence of many other unhealthy behaviours, beside insufficient leisure-time physical activity and unhealthy behaviours in nutrition related to obesity and diabetes, is the highest (40), as well as combination of multiple risky behaviours (56). According to the first analysis of CINDI Health Monitor survey 2004 (which serves as an efficiency evaluation tool for activities) it was shown e.g., that prevalence of every day consumption of sweet soft drinks decreased from 42.9% in 2001 to 29.1% in 2004 (57). The same study showed strong shift to more healthy behaviour also in use of fat for food preparation. The percent of people using lard decreased from 30.3% in 2001 to 20.8% in 2004, while the percent of people using olive oil increased from 7.1% to 15.2%. Unfortunately the comparison in physical activity behaviour was impossible since in 2004 the long last-7-days self-administered format of IPAQ was used instead of the short last-7-days self-administered format (46) in order to distinguish between physical activity from different sources (leisure time activities, housekeeping work, physical activity at the work-place, and transportation physical activity).

### *Conclusions*

The results of this study with its unique methodology proved to be powerful tool in development and implementation of an effective healthy nutrition and physical activity intervention programmes in Slovenia, as well as in robust assessment of their effectiveness and efficiency. The information on the prevalence of unhealthy behaviours in nutrition related to obesity and diabetes and insufficient physical activity in Slovenia, even rough, is very important for high quality health promotion and disease prevention planning at national or regional levels, since these data provide information about the comprehensive dimensions of the problem in the community.

### **CINDI and related surveys in developing other interventions for controlling non-communicable diseases in adult population**

The results of above described study, as well as of the other studies based on CINDI methodology certainly serve as a basic knowledge of high-quality and applicability in preparation of PH strategies/activities in Slovenia as well as in evaluation of their efficiency.

Similar methodology as used in analysis and identification of population at risk for unhealthy behaviours in nutrition related to obesity and diabetes and insufficient physical activity was used in different other unhealthy behaviours (e.g. frequent perception of stress) and in some diseases/health states as well (e.g. musculoskeletal diseases and disorders). A detailed description on CINDI Health Monitor Survey 2001 results is available in an extensive survey report in Slovene language for fund providers - Ministry of Education and Sports and Ministry of Health of Republic of Slovenia (58). This report is composed of several in-depth studies on different unhealthy behaviours in Slovene adults. A short version is available in English language as well (48). Some of in-depth studies basing on CINDI Health Monitor Survey 2001 data-base were published in domestic or international periodics, mostly in English language. Additionally,

interregional differences in different health phenomena inside Slovenia were possible to assess since the data enabled this kind of analyses. Chronologically these studies are as follows:

1. The studies on interregional differences in health (59) and health behaviours (40),
2. The study on identification of population groups at very high risk for frequent perception of stress (60) (in English language),
3. The study on identification of population groups with multiple hazardous health behaviours for cardiovascular diseases (56) (in English language).
4. The study on prevalence of selected musculoskeletal diseases and disorders in different population groups (61) (in Slovene language).
5. The study on seat-belt use and non-use in adults (62) (in English language),
6. The study on population groups at high risk for poor oral self-care (63) (in English language), and
7. The study on self-rated health with emphasis on poor self-rated health (64) (in English language).

Also studies basing on CINDI Risk Factors and Process Evaluation surveys data serve to the same purpose. They are less numerous but not less important:

1. The study on efficiency of CINDI programme in controlling hypertension in adult population of Ljubljana demonstrational level in 12-year period (65,66) (in English language), and
2. The detailed study on prevalence of arterial hypertension, its awareness and control in the adult population of the Ljubljana area (67) (in English language).

Some other surveys were in the last years performed in Slovenia as well. The results were published only in Slovene language so far:

1. The study on effectiveness of Beltinci “Let’s Live Healthy” project (37) (in Slovene language).

Results of Beltinci process evaluation surveys showed considerable improvement not only in health behaviours but also in some of the physiological risk factors. The study was performed on 158 adults with monitoring/observation of health indicators on physiological risk factors before and after the intervention programme was carried out. After only one year of intervention activities, the average values of systolic blood pressure decreased by 4.7%, diastolic blood pressure by 4.1%, and blood cholesterol by 4.9%. All differences were statistically highly significant. This project was already spread from Beltinci community to other parts of Slovenia as a part of implementation of already mentioned nation-wide strategy for prevention of cardiovascular diseases (55). The results are very promising and stimulative and people susceptible to them but sustainability is under the question as Slovenia is still in the time of transition and the priorities are changing all the time.

2. A multisectorial and multidisciplinary research project “Physical activity for health” (49) (in Slovene language).

This project was composed of several cross-sectional studies in adult population as well as in children. It was focused particularly in leisure-time physical activity. As already mentioned, results of this project showed that the prevalence of practicing regular leisure-time physical activity was the lowest in Eastern Slovenia, in rural environments, and in hard workers in rural economy.

## EXERCISES

### Task 1

Carefully read the part on theoretical background of this module. Critically discuss the characteristics of health surveys with your colleagues.

### Task 2

From domestic (e.g. Biomedicina Slovenica, and COBISS-Cooperative Online Bibliographic System of Slovenia in Slovenia), and/or international bibliographic databases (e.g. Medline, PubMed) find out if any other health survey has been already performed in your country. If yes, then try to find out its characteristics and how its results were used in health care planning.

### Task 3

If not, try to find an example from other countries (e.g. FINBALT Health Monitor Surveys).

### Task 4

Discuss with your colleagues how the advantage was taken of in these surveys and make proposals how they could be used more efficiently.

## REFERENCES

1. Last JM (editor). A dictionary of epidemiology. Oxford: Oxford University Press, 2001.
2. Rossi PH, Freeman HE. Evaluation: A Systematic Approach. Newbury Park: Sage Publications, 1993.
3. Glossary of Health Care and Health Care Management Terms <http://depts.washington.edu/hsic/resource/glossary.html>
4. Aromaa A, Koponen P, Tafforeau J (uredniki). Status and future of health surveys in the European Union. Final report of Phase 2 of the project Health Surveys in the EU: HIS and HIS/HES Evaluations and Models. Helsinki, Bruxelles: National Health Institute KTL, Scientific Institute of Public Health; 2003.
5. Abramson JH. Cross-sectional studies. In: Detels R, McEwen J, Beaglehole R, Tanaka H (editors). Oxford textbook of public health. Oxford: Oxford University Press, 2002. p.509-528.
6. Hennekens CH, Buring JE. Epidemiology in medicine. Boston, Little, Bown and Company, 1987.
7. Dos Santos Silva I. Cancer Epidemiology: Principles and Methods. Lyon: IARC, 1999.
8. Beaglehole R, Bonita R, Kjellström. Basic epidemiology. Geneva: World Health Organization, 1998.
9. Jekel JF, Katz DL, Elmore JG. Epidemiology, biostatistics, and preventive medicine. Philadelphia, W.B. Saunders company, 2001.
10. Premik M. Introduction to epidemiology [in Slovene]. Ljubljana: Faculty of Medicine, 1998.
11. Pearce N. A Short Introduction to Epidemiology. Second Edition. Wellington, New Zealand: Centre for Public Health Research, Massey University Wellington Campus, 2005.

12. Bailey KD. *Methods of social research*. New York: The Free Press (A Division of Macmillan, Inc.), 1987.
13. Vaughan JP, Morrow RH. *Manual of epidemiology for district health management*. Geneva: WHO, 1989.
14. Brownson RC, Baker EA, Leet T, Gillespie KN. *Evidence based public health*. Oxford, New York: Oxford University Press, 2003.
15. Hansen MH, Hurwitz WN, Madow WG. *Sample survey methods and theory*. Volume I Methods and applications. New York: John Wiley Sons, 1993.
16. Kleinbaum DG, Kupper LL, Morgenstern H. *Epidemiologic research*. New York: Van Nostrand Reinhold, 1982.
17. Detels R, McEwen J, Beaglehole R, Tanaka H (editors). *Oxford textbook of public health*. Oxford: Oxford University Press, 2002.
18. Altman DG. *Practical statistics for medical research*. Chapman & Hall: 1993.
19. Lutz W, Chalmers J, Lockerbie L, Hepburn W. *Health and community surveys*. Volume 1. A practical manual for health and community workers. Geneva: IEA, World Health Organization, MacMillan, 1992.
20. Lutz W, Chalmers J, Lockerbie L, Hepburn W. *Health and community surveys*. Volume 2. A practical manual for health and community workers. Geneva: IEA, World Health Organization, MacMillan, 1992.
21. Aday LA. *Designing and conducting health surveys: a comprehensive guide*. San Francisco: Jossey-Bass, 1996.
22. Bankowski Z, Bryant JH, Last JM (editors). *Ethics and epidemiology: international guidelines*. Proceedings of the XXVth CIOMS Conference. Geneva: Council for International Organizations of Medical Sciences, 1991.
23. World Medical Association. *World Medical Association Declaration of Helsinki. Ethical Principles for Medical Research Involving Human Subjects*. Available at: URL: <http://www.wma.net/e/policy/b3.htm> (Accessed: 17 April 2008).
24. Public Health Leadership Society. *Principles of the ethical practice of public health*. New Orleans: Public Health Leadership Society; 2002. Available at: URL: <http://209.9.235.208/CMSuploads/PHLSethicsbrochure-40103.pdf> (Accessed April 23, 2008).
25. United Kingdom Evaluation Society. *Public Library/Glossary. Glossary of Evaluation Terms*. Available from: URL: [http://www.evaluation.org.uk/Pub\\_library/Glossary.htm](http://www.evaluation.org.uk/Pub_library/Glossary.htm) (Accessed: Aug 10, 2007).
26. Rychetnik L, Hawe P, Waters E, Barratt A, Frommer M. A glossary for evidence based public health. *J Epidemiol Community Health* 2004;58:538-545.
27. McLeroy K, Norton B, Kegler M, et al. Community-based intervention. *Am J Public Health* 2003;93:529-33.
28. World Health Organization, Regional Office for Europe. *Countrywide Integrated Noncommunicable Diseases Intervention (CINDI) programme*. Home page. Available from: URL: <http://www.euro.who.int/CINDI> (Accessed: Aug 10, 2007).
29. World Health Organization, Regional Office for Europe. *CINDI Countrywide Integrated Non-communicable Diseases Intervention Programme. Protocol and guidelines for monitoring and evaluation procedures*. Berlin: Springer-Verlag; 1987.
30. World Health Organization, Regional Office for Europe. *Handbook for process evaluation in noncommunicable disease prevention. CINDI 2000*. Copenhagen: World Health Organization, Regional Office for Europe. Available from: URL: <http://www.euro.who.int/document/E66338.pdf> (Accessed: August 20, 2007).
31. Puska P, Tuomilehto J, Nissinen A, Vartainen E. *The North Karelia project. 20 year results and experiences*. Helsinki, National Public Health Institute; 2001.

32. WHO, Regional Office for Europe. CINDI 2000. Protocol and guidelines. Copenhagen: WHO, 1996.
33. Prättälä R, Helasoja V, Laaksonen M, Laatikainen T, Nikander P, Puska P. Cindi health monitor. Proposal for practical guidelines. Helsinki: National Public Health Institute, 2001.
34. Zaletel-Kragelj L, Fras Z, Maucec Zakotnik J. Monitoring of the situation regarding cardiovascular diseases in adult Slovene population and its role for quality assurance in their treatment [in Slovene]. *Slov. Kardiol* 2006; 3: 4-12.
35. Mauček Zakotnik J, Fras Z, Zaletel-Kragelj L. The WHO Countrywide Integrated Non-communicable Diseases (CINDI) programme in Slovenia. In: Donev D, Pavleković G, Zaletel-Kragelj L (editors). *Health promotion and disease prevention: a handbook for teachers, researchers, health professionals and decision makers*. Ljubljana: Hans Jacobs publishing company, 2007. p. 204-219. Available at: URL: <http://www.snz.hr/ph-see/publications.htm> (Accessed April 23, 2008).
36. Zaletel-Kragelj L. Risk factors for noncommunicable diseases in adults in Slovenia Ljubljana. Survey protocol. [in Slovene] Ljubljana: Institute of Public Health, Faculty of Medicine and CINDI-Slovenia, 2001.
37. Zelko-Peterka E, Zaletel-Kragelj L. Local community health enhancing programme assessment. The case of Beltinci community [in Slovene]. *Slov Kardiol* 2005;2:8-12.
38. National Institute of Public Health Determinants of the burden of disease in the European Union. National Institute of Public Health, Stockholm, 1997.
39. World Health Organization (2002) *The world health report 2002: reducing risks, promoting healthy life*. World Health Organization, Geneva.
40. Zaletel-Kragelj L, Eržen I, Fras Z. Interregional differences in health in Slovenia: II. Estimated prevalence of selected behavioral risk factors for cardiovascular and related disease. *Croat Med J* 2004; 45: 644-50. Dostopno na: URL: <http://www.cmj.hr/2004/45/5/15495295.pdf> (Accessed: August 10, 2008).
41. Zaletel-Kragelj L, Fras Z, Maucec Zakotnik J. Results of CINDI Health Monitor surveys in Slovenia as a tool for development of effective healthy nutrition and physical activity intervention programmes. *J Public Health* 2006, 14: 110-118. Available from: URL: <http://www.springerlink.com/media/927ywwwtml6x73yyrqau/contributions/x/1/2/2/x122x18g238p15v7.pdf> (Accessed: Aug 24, 2008).
42. European Commission. Status report on the European Commission's work in the field of nutrition in Europe. EC, Bruxelles, 2002.
43. World Health Organization. Recommendations for preventing diabetes. In: World Health Organization. *Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO expert consultation*. WHO (WHO Technical Report Series 916), Geneva, 2003. p. 72-80.
44. World Health Organization. *Integrated prevention of noncommunicable diseases. Draft global strategy on diet, physical activity and health*. WHO (WHO EB113/44), Geneva, 2003.
45. World Health Organization. *Diet, nutrition and the prevention of chronic diseases. Report of a joint WHO/FAO expert consultation*. World Health Organization (WHO Technical Report Series 916), Geneva, 2003.
46. IPAQ Group. *International Physical Activity Questionnaire*. Available from: URL: <http://www.ipaq.ki.se/> (Accessed: Aug 24, 2005).
47. Hanžek M (editor). *Human development report. Slovenia 1999*. Institute of Macroeconomic Analyses and Development & United Nations Development Programme, Ljubljana, 1999.

48. Zaletel-Kragelj L, Fras Z, Maučec Zakotnik J. Health behaviour and health among Slovene adult population, 2001 CINDI Health Monitor Survey 2001. University of Ljubljana, Faculty of medicine, 2005.
49. Završnik J, Pišot R, Fras Z, Zaletel-Kragelj L, Strel J, Sila B, Žerjal I, Zurc J, Kropelj In: Physical activity for health: presentation of results of Targeted Research Programme "Competitive position of Slovenia 2001-2006" [in Slovene]. Univerza na Primorskem, Znanstveno-raziskovalno središče, Inštitut za kineziološke raziskave, Koper, 2004.
50. World Health Organization, Regional Office for Europe. CINDI Health Monitor: A Study of feasibility of a health behaviour monitoring survey across CINDI countries. Data book. WHO, Regional Office for Europe, Copenhagen, 2003.
51. Zaletel-Kragelj L, Eržen I. Assessment of selected health conditions and selected risk factors. In: Zaletel-Kragelj L, Eržen I, Belović B, Artnik B, Premik M, Zelko-Peterka E. Assessment of interregional differences in health in Slovenia and searching for solutions for diminishing them. Final report on project of Targeted Research Programme [in Slovene]. Univerza v Ljubljani, Medicinska fakulteta, Katedra za javno zdravje, Ljubljana, 2003. p 15-86
52. Wilson AJ, Oldenburg BF, Lopez AD. Targeted approaches for reducing inequities in chronic disease. *MJA* 2003;179:231-232.
53. Oldenburg B. Preventing chronic disease and improving health: broadening the scope of behavioural medicine research and practice. *Int J Behav Med* 2002; 9:1-16.
54. Javornik J, Korošec V (editors.). Human development report. Slovenia 2003. Institute of Macroeconomic Analyses and Development & United Nations Development Programme, Ljubljana, 2003.
55. Fras Z, Maučec Zakotnik J (2002) Life-style interventions in primary health care – implementation of Slovenian CINDI approach as a national strategy for prevention of coronary heart disease. In: International conference: Promoting health through physical activity and nutrition. Radenci, Slovenia, April 18-21, 2002. Final programme: abstracts and papers. CINDI Slovenija, Ljubljana, pp 87-93.
56. Zaletel-Kragelj L, Fras Z (2005) Identification of population groups with multiple hazardous health behaviours for cardiovascular diseases in Slovenia. *Slov Kardiol* 2: 112-117.
57. Zaletel-Kragelj L, Maučec Zakotnik J, Belović B (2005b) Assessment of health promotion activities in Health region Pomurje. First results of "CINDI Health Monitor Slovenia 2004" [in Slovene]. In: Fras Z (ed.) Slovene Forum for cardiovascular diseases prevention 2005: book of articles. Združenje kardiologov Slovenije, Ljubljana, pp 27-32.
58. Zaletel-Kragelj L, Fras Z, Maučec Zakotnik J (editors). Risky behaviours related to health and selected health conditions in adult population of Slovenia: results of Slovenia CINDI Health Monitor Survey 2001 [in Slovene]. Ljubljana: CINDI Slovenia, 2004.
59. Zaletel-Kragelj L, Eržen I, Fras Z. Interregional differences in health in Slovenia: I. Estimated prevalence of selected cardiovascular and related diseases. *Croat Med J* 2004; 45: 637-643. [www.cmj.hr/2004/45/5/15495294.pdf](http://www.cmj.hr/2004/45/5/15495294.pdf) (Accessed: Aug 27, 2008).
60. Zaletel-Kragelj L, Pahor M, Bilban M. Identification of population groups at very high risk for frequent perception of stress in Slovenia. *Croat Med J* 2005; 46:153-161. Available from URL: [www.cmj.hr/2005/46/1/15726688.pdf](http://www.cmj.hr/2005/46/1/15726688.pdf) (Accessed: Aug 27, 2008).

61. Djomba JK. Estimated prevalence of selected musculoskeletal diseases and disorders in different population groups in Slovene adults [in Slovene]. Department of Public Health, Faculty of Medicine, University of Ljubljana, Ljubljana; 2005.
62. Bilban M, Zaletel-Kragelj L. Seat-belt use and non-use in adults in Slovenia. *Int J Public Health* 2007;52: 317–325. Available from URL: [http://cmk-proxy.mf.uni-lj.si:2120/content/v21305257r73/?sortorder=asc&p\\_o=10](http://cmk-proxy.mf.uni-lj.si:2120/content/v21305257r73/?sortorder=asc&p_o=10) (Accessed: Aug 27, 2008).
63. Artnik B, Zaletel-Kragelj L. Population groups at high risk for poor oral self-care: the basis for oral health promotion. *Int J Public Health* 2008; 53:195-203. Available from URL: <http://cmk-proxy.mf.uni-lj.si:2120/content/x24075283644/?p=30af38ea7f56473f9bf3aec7427da2a3&pi=0> (Accessed: Aug 27, 2008).
64. Farkaš Lainščak J, Zaletel Kragelj L. Self-rated health in Slovenian adults. *Slov Kardiol* 2008; 5:42-49.
65. Bulc M, Fras Z, Zaletel-Kragelj L. Twelve-year Blood Pressure Dynamics in Adults in Ljubljana Area, Slovenia: Contribution of WHO Countrywide Integrated Non-communicable Diseases Intervention Program. *Croat Med J* 2006;47:469-77. Available from: URL: <http://www.cmj.hr/2006/47/3/16758526.pdf> (Accessed: Aug 24, 2008).
66. Zaletel-Kragelj L, Maučec Zakotnik J, Fras Z. Public health intervention programmes and their evaluation. In: Donev D, Pavleković G, Zaletel-Kragelj L (editors). *Health promotion and disease prevention: a handbook for teachers, researchers, health professionals and decision makers*. Lage: Hans Jacobs publishing company, 2007. p. 145-155. Available from URL: <http://www.snz.hr/ph-see/publications.htm> (Accessed: Aug 25, 2008).
67. Fras Z, Bulc M, Maucec Zakotnik J, Zaletel-Kragelj L. Prevalence of arterial hypertension, its awareness and control in the adult population of the Ljubljana area of Slovenia. Results of WHO's countrywide integrated noncommunicable diseases intervention (CINDI) program survey 2002/2003. *Slov Kardiol*, 2006; 3:106-114.

## RECOMMENDED READINGS

1. Abramson JH. Cross-sectional studies. In: Detels R, McEwen J, Beaglehole R, Tanaka H (editors). *Oxford textbook of public health*. Oxford: Oxford University Press, 2002. p.509-528.
2. Cross-sectional surveys. In: Dos Santos Silva I. *Cancer Epidemiology: Principles and Methods*. Lyon: IARC, 1999. p.213-229.
3. Maučec Zakotnik J, Fras Z, Zaletel-Kragelj L. The WHO Countrywide Integrated Non-communicable Diseases (CINDI) programme in Slovenia. In: Donev D, Pavleković G, Zaletel-Kragelj L (editors). *Health promotion and disease prevention: a handbook for teachers, researchers, health professionals and decision makers*. Lage: Hans Jacobs publishing company, 2007. p. 204-219. Available at: URL: <http://www.snz.hr/ph-see/publications.htm> (Accessed April 23, 2008).
4. Zaletel-Kragelj L, Eržen I. Cross-sectional studies. In: Božikov J, Zaletel-Kragelj L (editors). *Methods and tools in public health: a handbook for teachers, researchers, health professionals and decision makers*. Lage: Hans Jacobs publishing company, 2008. (in press). To be available at: URL: <http://www.snz.hr/ph-see/publications.htm>.

5. Zaletel-Kragelj L, Fras Z, Maucec Zakotnik J. Results of CINDI Health Monitor surveys in Slovenia as a tool for development of effective healthy nutrition and physical activity intervention programmes. *J Public Health* 2006, 14: 110-118. Available from: URL: <http://www.springerlink.com/media/927ywwwtml6x73yyrqau/contributions/x/1/2/2/x122x18g238p15v7.pdf> (Accessed: Aug 24, 2008).
6. Zaletel-Kragelj L, Maučec Zakotnik J, Fras Z. Public health intervention programmes and their evaluation. In: Donev D, Pavleković G, Zaletel-Kragelj L (editors). *Health promotion and disease prevention: a handbook for teachers, researchers, health professionals and decision makers*. Laga: Hans Jacobs publishing company, 2007. p. 145-155. Available at: URL: <http://www.snz.hr/ph-see/publications.htm> (Accessed April 23, 2008).