

2 DATA SOURCE

This chapter presents the technical background to this study. It describes the research context, data collection procedure, sample, representativeness of the sample with regard to the Slovak adolescent population, measurements, and the statistical analyses used.

2.1. RESEARCH CONTEXT

Socio-economic differences in health among children (*van der Lucht and Groothoff 1990, van der Lucht 1992, van der Lucht et al. 1992, van der Lucht and Groothoff 1995*), adolescents (*Tuinstra 1998, Tuinstra et al. 1998*), adults (*Ranchor et al. 1990, Ranchor 1994, Ranchor et al. 1995, Ranchor et al. 1996a*) and elderly (*Miedema, Ranchor 1995, Ranchor et al. 1996b*) are one of the topics of the Northern Centre for Healthcare Research at Groningen University.

This study presents a part of an international comparative longitudinal research, in which the same instruments are used to compare social patterns in health between Western and Central Europe in adolescence (*Tuinstra et al. 1995*). The Netherlands, Scotland and Slovakia are participating in this research.

The Scottish participation is based on “The Study of Youth and Health” (*West 1986*) which is a part of “The West of Scotland Twenty-07 study” (*MacIntyre 1987, MacIntyre et al. 1989*). The study has longitudinal design and involves a 20-year follow-up of three age cohorts, 15, 35 and 55 years at the baseline. Baseline data collection was performed in 1987/1988. The sample of adolescents consists of 1009 respondents from Central Clydeside Conurbation (Glasgow City and 10 surrounding local government districts), mean age 15 years.

The same or comparable indicators were used in the Dutch study “Health in Adolescence” (*Tuinstra 1998*), which is a part of the “Longitudinal Study into Social Inequality and Health from Adolescence to Early Adulthood” (prof. Dr. D.Post, prof. Dr. W.J.A. van den Heuvel, prof. Dr. J.W. Groothoff). The baseline data collection was performed in 1994/1995 in the northern part of the Netherlands (n=2090, mean age 16,2).

The Slovak study follows the larger part of the Scottish and the Dutch study of adolescents (see chapter 2.3). The aim of these studies is to explore health and social patterns in health with regard to a specific period of life and determinants of health (health risk behaviour, peer and parent impact and social support).

Slovakia is a Central European country with a population structure not deviating from the Central European neighbour countries.

2.2. DATA COLLECTION PROCEDURES, SAMPLE, REPRESENTATIVENESS

Data was collected in September, October 1998. Students of the first year of 31 secondary schools (7 grammar schools, 13 specialized schools and 11 apprentice schools, some of them offering various types of educational programmes) located in Kosice filled in the questionnaires. The sample consists of 2616 Slovak adolescents, 1370 boys and 1246 girls. This represents a response rate of 96,3%. The non-response was due to sick leave and other types of school absence. The age range is from 13,8 to 17,3 years (mean 14,9 years, STD 0,62).

This sample was stratified according to gender and type of school; the proportion of the five educational levels of the regular Slovak school system was maintained (see table 1). Individual schools were selected at random. The sample can be considered as representative of the Slovak adolescent population.

The respondents completed the questionnaire at school, in their classroom, under the guidance of a researcher. A team of five researchers participated in data collection. Besides the questionnaire, each adolescent was asked to fill in an informed consent which allows us to include participation in a follow-up study.

Table 1 The distribution of adolescents in population and in the research sample (in %)

	population *			sample		
	male	female	total	male	female	total
Grammar school	20,1	27,8	23,9	19,4	24,5	21,8
Specialized school	31,4	46,1	38,6	38,0	47,3	42,4
Apprentice school, 4-years	14,7	6,1	10,5	15,1	10,7	13,0
Apprentice school, 3-years	30,6	17,6	24,2	24,5	16,3	20,6
Apprentice school, 2-years	3,2	2,3	2,8	2,9	1,3	2,1

* Distribution of students in first grade of post-elementary schools in Slovakia 1998 (Based on official statistical data - Institute of Information and Prognosis of Education, Bratislava)

The secondary schools are mostly centralised but students come from the whole wide region area. As can be seen in table 2-3, the Kosice region includes 14% of Slovak population and does not differ a lot from the rest of Slovakia with regard to health (life expectancy, live birth, neonatal mortality, infant mortality rate, mortality, natural growth) and SES (unemployment) indicators. One exception may be the capital city, Bratislava, located at the border with Austria, and therefore characterised by a low unemployment rate.

About 90% of the adolescents in our sample come from the Kosice region and 10% comes from other regions (e.g. Presov, Zilina). Only 60% of the sample are

inhabitants of Kosice – town, but this includes also its suburban parts. Kosice city has about 240 000 inhabitants. The remaining 30% come from smaller towns and villages in the Kosice region. We did not expect a significant difference of our sample in comparison to the Slovak adolescent population.

Table 2 Health indicators: Comparison of Kosice region with Slovak Republic

	Kosice region	Slovak republic
inhabitants	– male	370 216
	female	390 900
	total	761 116
average age	– male	32,95
	female	36,05
live expectancy	– male	68,80
	female	76,70
live birth	12,58	10,68
neonatal mortality	6,26	5,38
infant mortality rate	12,52	8,79
mortality	9,60	9,86
natural growth	2,98	0,82

Source: Statistický úrad Slovenskej Republiky (1998), Meseznikov and Ivantysyn (1999)

Table 3 Unemployment: Comparison of Kosice region with Slovak Republic

	unemployment in % to Dec.1998	
Slovak republic*		15,6
Regions		
Bratislava	West	5,06
Trnava	West	12,51
Trencin	West	10,81
Nitra	West	17,64
Zilina	Central	14,07
Banska Bystrica	Central	19,70
Presov	East	22,07
Kosice	East	20,76

Source: Krajska sprava statistickeho uradu Slovenske republiky v Kosiciach (1999)

* In December 1998: 428 209 people were unemployed in Slovak Republic. (Meseznikov and Ivantysyn 1999)

2.3. QUESTIONNAIRE

The questionnaire is based on the ones used in the Scottish (*West 1986, MacIntyre 1987, MacIntyre et al. 1989*) and the Dutch (*Tuinstra 1998*) studies. Measurements were translated into the Slovak language and used in a pilot study (*Geckova et al. 1998b*). Based on literature study and the findings of the pilot study, the questionnaire was improved to be more appropriate for the Slovak adolescent population. The

final version consists of 6 parts:

1. demographic and socio-economic indicators
2. health indicators
3. health risk behaviour and attitudes towards health risk behaviour
4. parental and peers influence
5. social network and social support
6. personality (self-esteem, decision-making style)

In this section, an overall picture will be given of the central measurements. Each chapter describes the several instruments in its own section entitled "Methods".

2.3.1. DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS

The adolescents were asked to report date of birth and gender. Several socio-economic indicators were used: type of school, study programme (branch), highest completed education of father and mother, occupation of father and mother, proxy measures of SES (unemployment of parents, family structure, state benefit, available money per month).

Education

Adolescents reported about father's and mother's level of education in terms of successfully completed courses. The educational level was classified as: (1) university, (2) post secondary, (3) senior high school, (4) vocational, and (5) elementary or none.

Occupational group

The measure of parents' occupational class is based on asking adolescents about their father's and mother's current occupation, or their last occupation if they were currently unemployed. The obtained information was transformed into 9 categories of ISCO (1992, 1993): (1) legislators, senior officials and managers, (2) professionals, (3) technicians and associate professionals, (4) clerks, (5) service workers and shop and market sales workers, (6) skilled agricultural and fishery workers, (7) craft and related trades workers, (8) plant and machine operators and assemblers, and (9) elementary occupations.

Type of school

Children start attending school at 6 (+/- 1) years, and the general elementary programmes lasted 8 years. The year of data collection was the last one before transformation from 8-year into 9-year general elementary programmes. There are three main types of secondary education: apprentice programmes (2 or 3-year apprentice education without school leaving-examination and 4 or 5-year apprentice

education with school-leaving examination), specialised secondary schools (4-year programmes consisting of professional education with school-leaving examination) and grammar schools (4-year programmes preparing for university study, ending with school-leaving examination). The school-leaving examination is necessary for university study.

Adolescents were divided according to the type of school they attended into the three groups: grammar school students, specialised secondary school students, and apprentice school students.

Proxy measures of SES

The transformation process is strongly related to changes in socio-economic stratification. While socio-economic stratification is not stable, proxy measures of SES may be a reasonable way of checking the validity of the main socio-economic indicators like education, occupation and income. In this survey the following proxy measures were used: unemployment, family structure, number of siblings, state benefit, available money per month (earning and pocket money of adolescents).

2.3.2. HEALTH

Health was measured using several questionnaires and scales. We measured psychological health, vitality and mental health, experienced health complaints, chronic diseases, medical consumption (particularly prevalence of serious illness, injuries, physician visits and drug use), and also self-reported health and self-perceived vulnerability to illness.

Psychological health

Psychological Health was measured by the Slovak version of a 12-item version of the General Health Questionnaire (GHQ) (*Goldberg and Williams 1988*). The GHQ is a self-report questionnaire consisting of statements about aspects of well being, such as worries, tension or sleeplessness. With each statement, the current status of the respondent over the past four weeks is compared with his or her normal status by one of four responses. Two methods of scoring are used, a Likert score (range 0-36) and a binary score (range 0-12) which permits the identification of “cases” or in other words a level of symptomatology of potential clinical relevance. A cut-off point of 2/3 was used as a criterion for identification of “cases”. The selection of a cut-off point of 2/3 (scoring 0-0-1-1) as a criterion for cases in our research was based on the study by Banks (*1983*). Politi et al. (*1994*) used scoring 0-1-2-3 and found cut-off 8/9 the most appropriate. Based on scoring rules of Politi et al. (*1994*) the occurrence of cases among Slovak adolescents is 50,2% in male and 64,7% in female, instead of 23,9% in male and 41,3% in

female when the criterion for case is based on Banks' (1983) suggestion. In comparison with the criterion of Banks (1983), the criterion of Politi et al. (1994) has high sensitivity (98,4%) and low specificity (62,5%).

Reliability, in terms of internal consistency is satisfactory (Cronbach alfa 0,82). Politi et al. (1994), Katreniakova (2001) reported similar findings (Cronbach alfa 0,81/0,80).

Politi et al. (1994), in their sample of 18-year old Italians, used principal component analysis with varimax rotation to describe GHQ-12 items and found two factors: general dysphoria consisting of 7 items related to anxiety and depression and social dysfunction including 5 items testing the ability to perform daily activities and cope with everyday problems. Our findings, described in table 4, are very similar.

Table 4 Psychological health – factor analyses

	Component	
	1	2
Could not concentrate	,269	,515
Lost sleep	,586	,137
Not playing a useful part	,126	,619
Could not make a decision	,057	,697
Felt under strain	,678	,177
Could not overcome difficulties	,714	,217
Not enjoying day-to-day activities	,288	,575
Could not face problems	,056	,617
Unhappy and depressed	,730	,145
Lost confidence	,714	,117
Felt worthless	,714	,104
Not feeling happy	,455	,378

RAND 36

The original name of the questionnaire was SF-36 (Ware and Sherbourne 1992), but at the present time different names are used: RAND 36-Item Health Survey 1.0, SF-36 Health Survey (MOS SF-36) and Health Status Questionnaire (HSQ) (Hutchinson et al. 1996). RAND 36-Item Health Survey 1.0 is a generic self-completed multi-dimensional questionnaire measuring the health-related quality of life (Hutchinson et al. 1996) and seems to be a sensitive instrument for use in a population sample (Van der Zee and Sanderman 1993, Van der Zee et al. 1996).

Two scales (vitality and mental health scale) and two items (self-reported health, self-perceived vulnerability to illness) from the general health scale were used in the present study.

Vitality and mental health

Two scales of the Slovak version of the RAND-36 (*Van der Zee and Sanderman 1993, Van der Zee et al. 1996*) were used to measure vitality and mental health. The four items of the vitality scale are focused on feelings of energy and fatigue. The scale of mental health has five items representing feelings of depression and nervousness. The respondents were asked to evaluate their feelings over the past four weeks. The scores were transformed following the prescribed formula (range 0-100). A higher score indicates better health status.

Self-reported health

Self-reported health was measured by asking the respondents to describe their health as excellent, very good, good, fairly good or bad. This measurement is derived from an item of the RAND-36 (*Van der Zee and Sanderman 1993, Van der Zee et al. 1996*), the general health scale.

From international literature it is known that this question has a high predictable value for mortality and morbidity over long periods (*Kaplan and Camacho 1983, Kaplan et al. 1996, Appels et al. 1996, Jylhä et al. 1998*). "Perceived health incorporates a variety of physical, emotional, and personal components of health, which taken together comprise individual "healthiness"" (*Rahkonen et al. 2000, p.31*). As such, self-assessed health is a broad indicator of health-related well being (*Segovia et al. 1989*), and represents a robust, global summary measure of somebody's health status (*Manderbacka 1998*). Higher income, good child-parent relationship, higher interest and achievement in school, high self-esteem, not smoking, and being male were all positively and directly associated with higher self-ratings of health (*Vingilis et al. 1998*).

Self-reported vulnerability to illness

Self-reported vulnerability to illness is derived from an item of the RAND-36 (*Van der Zee and Sanderman 1993, Van der Zee et al. 1996*), the general health scale (gets sick a little bit easier than others). Adolescents were asked if they are more vulnerable to illness in comparison with other peoples (yes/no).

Long-term well-being (cheerfulness)

This measurement is derived from Nelson's "The Dartmouth COOP Functional Health Assessment Charts" (*Hutchinson et al. 1996*). The scale describes experienced feelings during the previous year. Respondents are asked to select one from 7 icons of faces which differ in intensity of smile. They should select that one which express their feelings during the last year the most. A higher score indicates lower long-term well-being or general quality of life.

Chronic diseases

Chronic diseases were assessed by means of a questionnaire based on the Health Interview Survey of the Dutch Central Bureau of Statistic (*CBS 1994*). This questionnaire was improved according to the results of a pilot study and accessible data about the prevalence of chronic diseases in adolescence (*Sobotik et al. 1994*). The questionnaire in the present study provides a selection of fourteen chronic diseases which are the most prevalent in adolescence. The respondents were asked whether or not they had suffered from any of these chronic diseases for longer than three months. We examined the prevalence of the separate chronic diseases and also the average number of used categories per person.

Experienced health complaints

Experienced health complaints were measured by the Slovak version of a shortened 13-item version of the VOEG (*Jansen and Sikkel 1994*). In the Slovak version 5-anchor scales were used to describe the frequency of suffering of included health complaints during the last month. For dichotomization, the frequency “to suffer three times and more during the last month” were used as a cut-off point. Both the prevalence of 13 separate VOEG items, and the sum score of the VOEG varying from 0-13, were examined.

Medical consumption

The questionnaire of medical consumption was created especially for the purpose of this study and was based on the questionnaire used in the Dutch sample (*Tuinstra 1998*). A set of 6 questions examined prevalence of serious illnesses (surgery, hospitalisation, other serious illnesses), injuries which required health service treatment, visits to doctors and the use of prescribed and non-prescribed drugs.

Self-reported Anthropometric measures and BMI

Adolescents reported their height and weight. BMI indexes were computed using following Quetelet index: $BMI = (\text{weight [kg]} / (\text{height [m]})^2)$

The average height reported by boys was 173,2 cm and by girls 165,6 cm. The average weight reported by boys was 59,3 kg and by girls 53,2 kg. The average BMI in boys was 19,7 and in girls 19,4. Novakova and Sevcikova (*1994*) using the data of the nation-wide Slovak anthropometric survey of children and youth in 1991, report for 15-years old adolescents average height in male 170,5 cm, in female 163,2 and average weight in male 58,2 kg and in female 54,3 kg.

2.3.3. HEALTH RISK BEHAVIOUR AND ATTITUDES TOWARDS HEALTH RISK BEHAVIOUR

Four types of health risk behaviour, namely smoking, alcohol consumption, drug experience and lack of physical exercise, and attitudes toward two types of health risk behaviour (smoking, marijuana and hash use) were explored. Data were obtained through a questionnaire created on the basis of a Dutch study (*Tuinstra 1998*).

Smoking

The prevalence of the experience with smoking, intensity of smoking and attitudes towards smoking was measured using 3 items. Adolescents were asked if they had ever smoked (1- no, never, 2 – yes, I have tried, 3- sometimes I smoke, but not daily, 4 – I smoke daily now), how many cigarettes they smoked per day (1- I do not smoke, 2 – not more than one cigarette, 3- two to five cigarettes, 4- six to ten cigarettes, 5- eleven and more cigarettes) and what they think about their smoking in future (1- I think I will never start smoking, 2- I smoked in the past, but I have stopped, 3- I am just trying to stop smoking, 4- I think I will stop smoking, 5- I have no idea, 6- I think I will start smoking sometime, maybe later, 7- I think I will smoke all my life).

Alcohol consumption

Experience with alcohol consumption and frequency of alcohol consumption were explored by asking adolescents if they drank alcohol sometimes (1-no, never, 2-yes, but only low-alcohol drinks, 3-yes, sometimes I drink a glass of spirits) and how many times they had drunk alcohol during the previous month (1- not once, 2- once or twice, 3-three to five times, 4-six to ten times, 5-ten times and more).

Drug use

Adolescents were also asked if they had ever used marijuana or hash (1-no, never, 2-I have used it once, 3-I use it sometimes, no more than once a month, 4-I use it regularly, more than once a month).

Lack of physical exercise

The frequency of physical exercise longer than 20 minutes was measured using four alternatives: (1) I do not do sport, (2) less than 2-3 times per week, (3) at least 2-3 times per week and (4) more than 3-4 times per week. Physical education was excluded. Respondents were also required to list the sports in which they actively participated.

2.3.4. PARENT AND PEER IMPACT

The respondents were asked if their parents did sport weekly, smoked daily, drank alcohol at least once a week, or got drunk at least once a month. They could select one of the following alternatives: (1) no, (2) yes, mother, (3) yes, father, (4) yes, both parents.

The adolescents reported how many of their friends did sport weekly, smoked daily, drank alcohol at least once a week, got drunk at least once a month, or used marijuana or hash. The results were: (1) nobody, (2) several, (3) half of them, (4) majority, and (5) all of them.

2.3.5. SOCIAL SUPPORT

Adolescents were asked how many good friends they had (none, 1-2, 3-5, more than 5) and if they thought they had enough friends (yes/ no). We wanted to find out what type of peer contact occurred among adolescents. They could select one or more choice from the following list: a. dating, b. confidential friendship, c. membership to a group, d. friends among classmates, e. youth meetings, f. other, g. no significant contacts with peers.

The social network and social support were described by three questions. Firstly, adolescents were asked to write a list of important persons whom they considered as important in their life, whom they needed, without whom it would be difficult for them, whom they could rely on, and with whom they could talk or ask for help. Adolescents were asked to indicate one of them as the most important person. Secondly, adolescents were asked on whom they relied the most frequently when they needed to talk about serious topics. They should select only one person. Thirdly, adolescents were asked whom they could rely on, with whom they usually talked about, and whom they usually asked for help if they had the following five sets of problems: a. school, homework, b. people, relationships, c. serious resolutions about my future, d. health, health troubles, e. psychological problems.

2.3.6. PERSONALITY

Self-esteem

The measure of self-esteem employed the 10-item Rosenberg self-esteem scale (*Rosenberg 1965*). Respondents were asked to strongly agree, agree, disagree, or strongly disagree with 5 positive and 5 negative statements dealing with a favourable or unfavourable attitude toward oneself. The sumscore varies from 10 to 40;

a higher score means higher self-esteem.

The reliability of Slovak translation of this scale is sufficient (Cronbach alfa 0,71). Slightly higher internal consistency was reported by Katreniakova (2001) from a sample of school children (Cronbach alfa 0,74) and also Allgood-Merten et al. (1990) in a sample of 13-19 years olds (Cronbach alfa 0,88), Andrews and Brown (1993) in a sample of 15-25 years olds (Cronbach alfa 0,83).

Boys are characterised by significantly higher self-esteem in comparison with girls. Mean sum scores and standard deviation are described in table 5.

Table 5 Self-esteem in male and female (mean sum scores and standard deviation)

	M	STD	gender differences (t-test)
male	29,5	3,68	0,000
female	28,0	3,84	

Satisfaction with figure

Adolescents were asked how they were satisfied with their figure. This scale gives additional information about self-esteem, particularly one specific dimension of self-esteem which is very important in this age.

Satisfaction with the figure is significantly lower among girls in comparison with boys. Half of the girls in comparison to 1/5 of the boys were not satisfied with their figure. Findings are described in table 6.

Table 6 Satisfaction with figure (in %)

	male	female	gender differences (chi-square)
very satisfied	13,0	3,7	0,000
satisfied	53,5	43,9	
does not matter	11,8	5,0	
not satisfied	19,4	40,3	
very unsatisfied	2,3	7,2	

Decision-making style

The Adolescent Decision Making Questionnaire (Mann et al. 1989, Tuinstra 1998) is a self-reported questionnaire consisting of 30 items. Respondents could mark one of four responses to each item: (1) never true, (2) often true, (3) sometimes true, (4) always true. A high score represents a high level of the regarding subscale (self-confidence, vigilance, panic, evasiveness, complacency). There were three exceptional items for the subscale self-confidence which were reversed, because their negative formulation. Mean score and standard deviation of the subscale are described in table 7.

Table 7 Scores on the Adolescent Decision Making Styles

	male		female	
	M	STD	M	STD
self-confidence	2,8	0,60	2,7	0,58
vigilance	2,9	0,54	2,8	0,51
panic	2,0	0,61	2,1	0,60
evasiveness	1,8	0,62	1,7	0,55
complacency	1,9	0,52	1,7	0,44

2.4. STATISTICAL ANALYSES

In this study several techniques for analysing our data have been used. Most of them used statistical software package SPSS, version 7.5.2. Besides this LISREL version 8.3 software (*Jöreskog and Sörbom 1993*) was also used. In this section we will shortly list the analyses used. Further details of the analyses can be found in the section "Analysis" of the separate chapters.

Gender differences in health, described in chapter 3, were tested by t-test for continuous and chi-square for dichotomous variables. Logistic regression for the dichotomised categorical health measures and the analysis of variance for continuous health measures were used to test the socio-economic health differences in chapter 4. Two models were fitted, one without the interactions and one with interactions between gender and socio-economic status. In chapter 5, a Mann-Whitney test was used to explore gender differences in health risk behaviour and attitudes towards health risk behaviour, and Kruskal-Wallis test to test socio-economic differences in health risk behaviour and attitudes towards health risk behaviour. General linear models were used to explore the influence of health risk behaviour and socio-economic status on the health of adolescents, and logistic regression was used to explore the prevalence of smokers and alcohol consumers among socio-economic groups of adolescents in chapter 6. Support for the model of interrelation between SES, parental smoking, peers' smoking and adolescents' smoking behaviour, described in chapter 7, was provided using LISREL analyses (path analyses with one latent variable). Logistic regression for the dichotomised categorical health measures and the analysis of variance for continuous health measures were used to explore the influence of social support on health among gender and socio-economic groups of adolescents in chapter 8.